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ON-SITE GROUNDWATER SAMPLING PLAN
MONTROSE SITE
TORRANCE, CALIFORNIA

Hargis & Associates, Inc.
CONSULTANTS IN HYDROGEOLOGY
TUCSON, ARIZONA

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Hargis & Associates, Inc.

ON-SITE GROUNDWATER SAMPLING PLAN
MONTROSE SITE
TORRANCE, CALIFORNIA

INTRODUCTION

This Sampling Plan has been prepared for monitoring wells to be constructed as part of the remedial investigation being conducted at the Montrose site. Adherence to the protocols described herein will ensure that the data collected are representative of site conditions, will provide records of traceability and adherence to prescribed protocols, and will provide a basis from which confident conclusions can be drawn to support the feasibility study. This sampling plan, to be conducted during the RI/FS field activities at the Montrose site, includes discussion of the following:

- Monitor well construction.
- Objectives of the sampling activities.
- Sample locations and methodology for site selections.
- Sampling equipment and methods of sample collection, preservation, and handling.
- Chain-of-custody procedures.
- Number and frequency of samples.

.. Analytical methods.

.. Storage and shipping methods.

.. Site safety procedures.

HISTORICAL BACKGROUND

The Montrose site occupies about 13 acres in Torrance, California. The area is bounded by Normandie Avenue on the east, Jones Chemical Company to the south, a vacant lot to the west, and the McDonnell-Douglas facility to the north (Figure 1). The surrounding area consists of mixed residential, commercial, and industrial zones. In addition, the Del Amo hazardous waste site is located about one-half mile southeast of the Montrose site.

Between 1947 and 1982, Montrose Chemical Corporation operated a DDT manufacturing facility in Torrance, California. In 1972, the use of DDT was banned in the United States. The use of DDT was not banned in other countries, and Montrose continued to manufacture and export DDT until 1982, when the facility was closed and completely dismantled. The Montrose site is now a vacant tract of land.

Previous investigations addressing the potential for contamination at the Montrose site include off-site sampling of sediments and surface runoff by the U.S. Environmental Protection Agency (EPA) and its contractors, California Department of Health Services, and the Regional Water figure 1

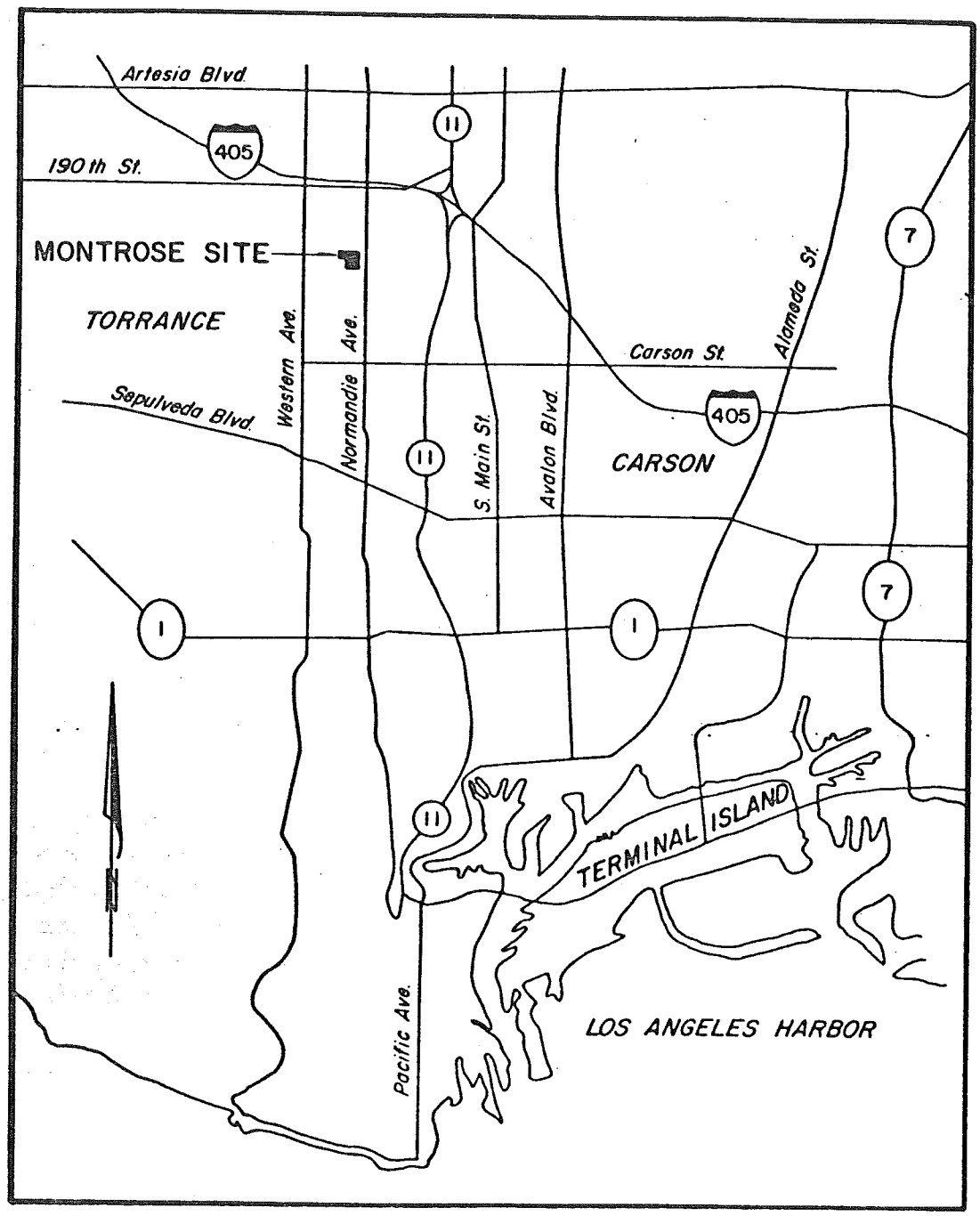


FIGURE I. LOCATION OF MONTROSE SITE

Quality Control Board, Los Angeles Region. An EPA investigation in November 1982 detected DDT in surface water runoff and sediments off-site of the Montrose property. These investigations resulted in simultaneous issuance of enforcement orders by the EPA and the California Regional Water Quality Control Board , Los Angeles Region, in May 1983. The majority of data concerning the Montrose facility have been summarized in two previous reports by EPA contractors: CERCLA Investigation, Montrose Chemical Corporation, Ecology & Environment, Inc., November 9-10, 1982; and Review of Proposed Response to EPA Enforcement Order No. 83-01, Metcalf & Eddy, Inc., November 1983.

In June 1983 Montrose submitted a proposal for remedial action at the site consisting of plans to pave the site with concrete and asphalt so that no portion of the soil would remain exposed, construction of an earthen berm to contain on-site stormwater drainage, and construction of a concrete curb around the perimeter to prevent off-site stormwater drainage from entering the site. Consultants for Montrose Chemical Corporation drilled two sets of exploratory soil borings at the facility in June and August 1983, and sampled the soils at varying depths for analysis of DDT and its isomers (Hargis & Montgomery, Inc., 1983).

The initial phase of Montrose on-site soil sampling comprised 25 soil borings drilled at sites selected based on historical operations at the facility. During the Montrose second round of drilling conducted in August 1983, nine deeper soil borings were drilled to assess further the vertical extent of soil contamination, and 14 additional borings were drilled to define further the areal extent of soil contamination. A total of 100 soil samples were collected and analyzed to determine the concentration of DDT.

The concentration of total DDT detected in the soil samples collected on-site from the depth interval zero to one foot ranged from 5.6 mg/kg (milligrams per kilogram) to 95,000 mg/kg (Hargis & Montgomery, Inc.,

1983). Analyses of soil samples collected from the depth interval one to two feet indicated concentrations of DDT ranging from 0.063 mg/kg to 59,000 mg/kg. Concentrations of total DDT detected in soil samples from the depth interval two to three feet ranged from 0.072 mg/kg to 810 mg/kg. Analyses of soil samples collected from the depth intervals three to four feet and four to five feet indicated concentrations of total DDT ranging from 0.028 to 31 mg/kg. Concentrations of DDT in soil samples from the depth intervals of five to six feet and six to about seven feet ranged from 0.033 mg/kg to 4.1 mg/kg. In general, the highest concentration of DDT was found in the upper two feet of soil on-site. At depths greater than two feet, the concentration of DDT in the soil decreased rapidly, with the majority of samples having concentrations less than 10 mg/kg (Hargis & Montgomery, Inc., 1983).

Concentrations of total DDT in soil samples collected from beneath the former surface impoundment ranged from 9,700 mg/kg to 27,000 mg/kg. Analyses of samples collected from the crushed concrete pile indicated total DDT concentrations ranging from 220 mg/kg to 640 mg/kg.

HYDROGEOLOGIC CONDITIONS

The Montrose site is located in the western portion of the coastal plain in Los Angeles County, California. Principal hydrogeologic units in the area include the Bellflower aquitard, and the Gage, Lynwood, and Silverado aquifers.

Data on hydrogeologic conditions in the immediate vicinity of the site is limited to data obtained from shallow monitor wells constructed at the Del Amo site and well logs and water levels from nearby water wells. Data from these wells indicate that the Bellflower aquitard may occur at a depth of 65 to 75 feet beneath the Montrose site. Groundwater was en-

countered beneath the nearby Del Amo site at depths ranging from 63 to 68 feet below land surface (Dames & Moore, 1984). The depth to the top of the Gage aquifer is probably on the order of 120 feet beneath the site. The Lynwood aquifer occurs at a depth of about 250 feet beneath the site, and is separated from the Gage aquifer by about 75 feet of clayey sediments. The Silverado aquifer occurs at a depth of approximately 500 feet beneath the facility, and is separated from the Lynwood aquifer by about 175 feet of clayey sediments. Groundwater for municipal supply is obtained from the Silverado aquifer in the area.

SAMPLING OBJECTIVES

The objective of the on-site groundwater sampling program is to determine if chemicals of concern used at the site are present in the shallow groundwater. The objective of the soil sampling during monitor well construction is to determine if chemicals of concern used at the Montrose site are in transit in the unsaturated zone between land surface and the first water bearing zone. Therefore, the groundwater and soil samples will be analyzed for those chemical constituents of concern used at the former facility (Table 1).

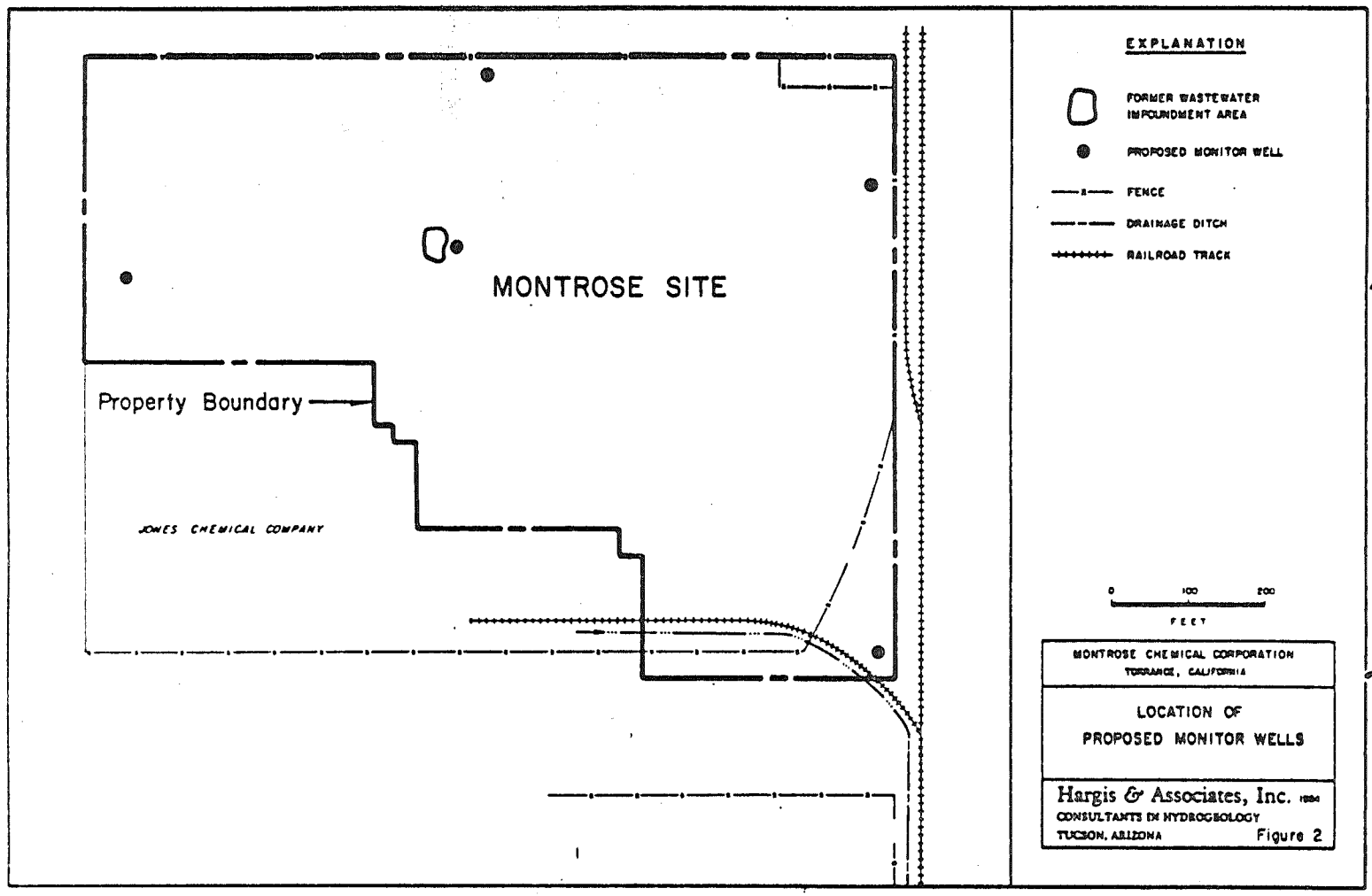
Five monitor wells will be constructed at the site to assess shallow groundwater conditions. One well will be located near the former surface impoundment, one along the west property boundary where high concentrations of DDT in the soils were detected, and one near the southeast corner of the site where runoff has periodically ponded (Figure 2). The remaining two wells will be located along the north and east property boundary, and will be used to assess direction of groundwater movement and define the chemical character of shallow groundwater.

TABLE 1

RAW MATERIALS USED IN DDT
MANUFACTURING PROCESS 1/

Ammonium & Sodium Lignin Sulfonates (Orzan)
Amorphous Silicon Dioxide Hydrated (Hi-Sil 233)
Calcium Silicate Synthetic (Micro-Cel E)
Calcim Sulfate Dihydrate (Industrial Ground Gypsum)
Chloral (trichloroethanal)
Magnesium Silicate Hydrate (Talc)
Monochlorobenzene (MCB)
Oleum - 65% (Fuming Sulfuric Acid)
Sodium-N-Methyl-N-Oleoyl Taurate (Igepon T-77)
Sulfonated Lignin (Reax 45A)
Sodium Hydroxide - 50% Solution

1/ Submitted to California Department of Health Services by MONTROSE CHEMICAL CORPORATION in May 1981.



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SAMPLING AND FIELD ACTIVITIES

Five monitor wells will be constructed and sampled on-site (Figure 2). If chemical constituents of concern used or manufactured at the former Plant are detected in the shallow groundwater, a second phase of monitor well construction and groundwater sampling may be required at the site. The monitor wells will be constructed to evaluate geologic conditions, the chemical character of soils in the unsaturated zone, direction of groundwater movement, and the chemical character of shallow groundwater.

GROUNDWATER SAMPLING

Groundwater monitoring wells will be constructed at the site to assess the shallow groundwater conditions occurring above or within the Bellflower aquitard. Data collected in the vicinity of the site indicate that the Bellflower aquitard may occur at a depth of 65 to 75 feet beneath the facility. The monitor wells will be completed to a depth of about 10 feet below the first groundwater encountered.

Monitor Well Construction

The five monitor wells will be drilled using auger methods. Each borehole will be drilled approximately 10 feet below the level at which the first groundwater is encountered. The monitor wells will be cased with four-inch PVC casing, with PVC screen placed from the water table to the total depth of the borehole. Each well will be gravel packed opposite the perforations and a cement bentonite seal placed on top of the gravel (Figure 3). The upper 10 feet of each borehole will be sealed with cement to prevent surface soils or runoff from entering the well. Development of

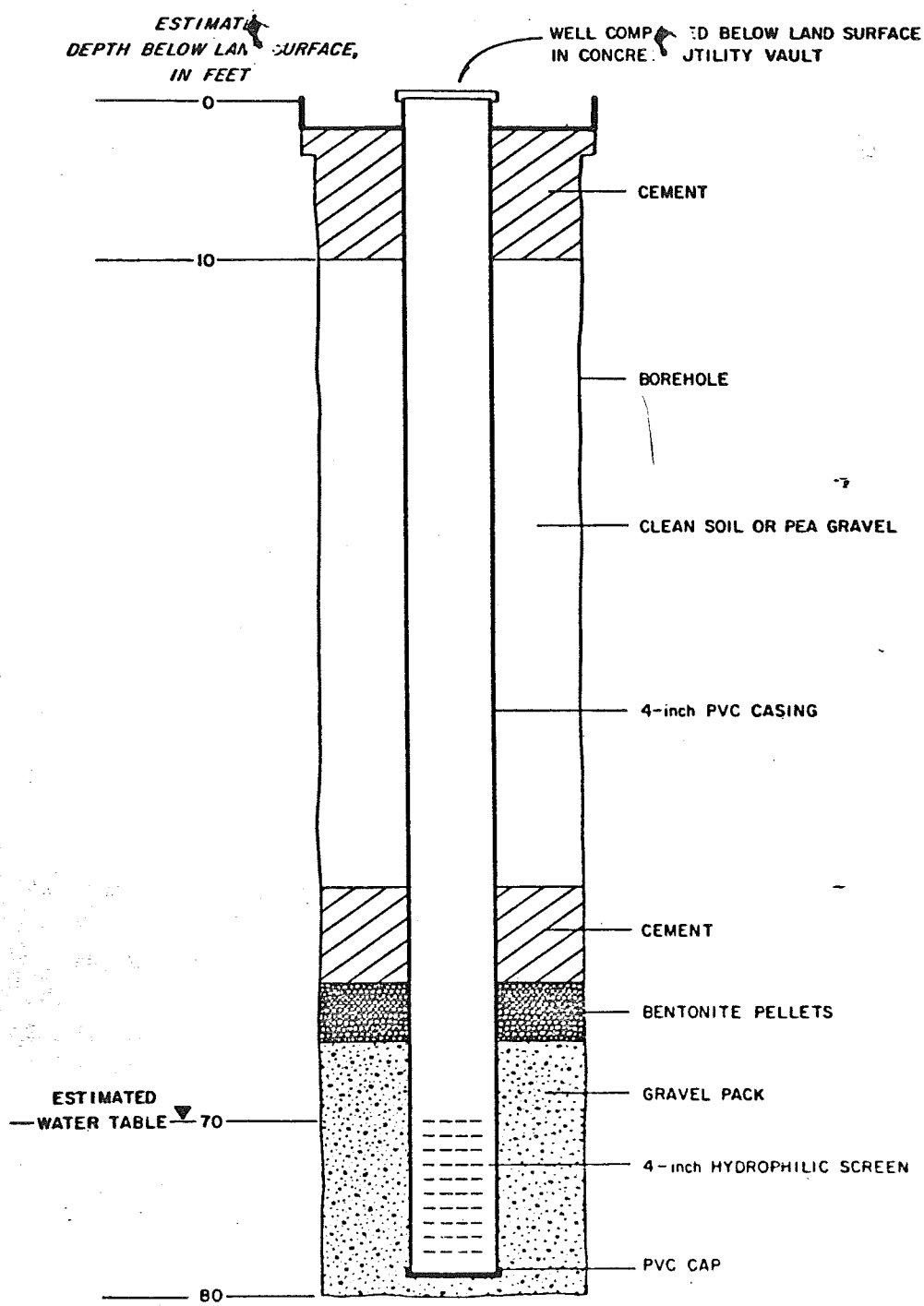

FIGURE 3. SCHEMATIC WELL CONSTRUCTION DIAGRAM

the well will consist of removal of several borehole volumes of groundwater by bailing or pumping. A dedicated submersible pump will be installed in each well to collect water samples if the wells are capable of yielding three to five gallons per minute. A locking steel cap will be placed over each well.

Sample Collection Procedures

Groundwater samples will be collected from each monitor well by pumping or bailing after a minimum of five borehole volumes of fluid have been removed. The temperature, pH, and specific electrical conductance (EC) of the well discharge will be measured to ensure that these parameters have stabilized prior to collection of samples.

Sampling procedure will consist of the following:

1. Measure the water level with an electric sounder or steel tape to the nearest 0.01 foot.

2. Pump or bail a minimum of five borehole volumes of fluid from each well, or until the field parameters pH, EC, and temperature have stabilized.

3. Collect the groundwater samples in the appropriate sample containers from the discharge pipe at the wellhead, or from the PVC bailer. The sample containers should be rinsed with the well discharge prior to sample collection, and properly labeled in the field.

4. Record all data in a field notebook.

The following information will be collected and entered into a field notebook each time a well is sampled: 1) static depth to groundwater, 2) the time that pumping or bailing begins, 3) the time of sample collection, 4) the pump discharge rate or number of bails, 5) the field parameters pH, EC, and temperature, and 6) the time that pumping or bailing stops.

Frequency of Sampling

An initial water sample will be collected from each monitor well at the end of the well development period. A second water sample will be collected approximately one month after the initial sample. Additional samples may be collected, depending on the results of chemical analyses of the first two samples.

Field Measurements and Equipment Requirements

Field measurements collected during the sampling activities will include water level measurements, discharge rates, electrical conductivity, temperature, and pH. A conventional pH meter with a combination gel-filled electrode will be used for field measurements. A combination conductivity-temperature-salinity meter will be used to measure the electrical conductivity. Temperature measurements will be obtained with a field thermometer and the result verified with the conductivity meter. The instruments will be calibrated periodically to ensure accuracy, and the probes thoroughly rinsed with distilled water before each measurement. All field measurements will be recorded in a field notebook.

Sample containers for routine constituents and trace metal analyses will consist of one-liter polyethylene bottles with polyethylene caps. Sample containers for analysis of monochlorobenzene and chloral consist of 40 ml (milliliter) glass vials equipped with teflon-lined septum. Sample containers for analysis of DDT consist of one-liter glass bottles with teflon-lined septum (Table 2).

Disposal and Containment of Drill Cuttings and Discharge Waters

All drill cuttings will be stored at the site until laboratory analyses determine if the cuttings contain chemical residues at hazardous concentrations. All drill cuttings will be disposed of in accordance with State regulations.

All discharge water will be stored at the site until results of laboratory analyses are available. The discharge water will be disposed of in accordance with State regulations.

SOIL SAMPLING DURING DRILLING OF MONITOR WELLS

During the monitor well construction, soil samples will be collected at approximately five foot intervals or at depths selected by the site geologist based on changes in lithology, unusual discoloration or odor, or other conditions noted by the geologist.

TABLE 2

WATER SAMPLE HANDLING, PRESERVATION, AND ANALYSIS

TYPE OF ANALYSIS	SAMPLE CONTAINER	PRESERVATION	ANALYTICAL METHODS
Common Ions[a]	1-liter polyethylene	Filter, Lab	As cited in Standard Methods and USEPA EMSL
Monochlorobenzene Chloral	40-ml glass vials with teflon-lined threaded caps	Refrigerate to 4 degrees C	EPA Method 624
Total DDT	1-liter glass bottle with teflon-lined threaded caps	Refrigerate to 4 degrees C	EPA Method 608

[a] Calcium, Magnesium, Sodium, Potassium, Carbonate, Bicarbonate, Chloride, Sulfate, Nitrate, Fluoride, Silica, Electrical Conductance, Total Dissolved Solids (Residue at 180 degrees C).

Sample Collection Procedures

Soil samples will be collected using split-spoon and Shelby tube samplers. Samples collected using brass Shelby-type tubes will be placed intact in clean glass jars with teflon-lined lids (Table 3). The ends of the tubes will be sealed with teflon caps or aluminum foil. Samples collected using other devices will be placed as undisturbed as possible in similar jars. All sampling devices will be cleaned thoroughly before each sample is collected. A description of each soil sample based on visual inspection will be compiled, and will include color, moisture content, and presence of foreign material, as well as soil classifications. Soil samples for analysis of monochlorobenzene, chloral, and DDT will be collected in clean glass containers with teflon-lined screw caps. Samples of soil from a remote location will also be collected and used as trip blanks.

Sample collection procedures will adhere to guidelines established in EPA publication SW-846 (2nd edition, July 1982) for soil and sludge samples. All samples will be labeled and refrigerated immediately after collection and will be delivered within 24 hours to the laboratory for analyses. General observations of climatic and site-specific conditions, and any other factors which may affect the collected sample, will be recorded. Lithologic logs for the soil borings will be compiled by the site geologist.

TABLE 3

SOIL SAMPLE HANDLING, PRESERVATION,
AND ANALYSIS

TYPE OF ANALYSIS	SAMPLE CONTAINER	PRESERVATION	ANALYTICAL METHODS
Monochlorobenzene Chloral	Sealed brass tube sleeve with teflon-lined threaded cap	Refrigerate to 4 degrees C	EPA Method 8240
Total DDT	Sealed brass tube sleeve with teflon-lined threaded cap	Refrigerate to 4 degrees C	EPA Method 8080

Field Measurements and Equipment Requirements

Field measurements for the soil sampling activities will include detailed descriptions of soils, hydrogeologic conditions, general climatic and site conditions, and other information which might influence the sample collected. In addition, an OVA (organic vapor analyzer) will be used to determine concentrations of volatile organic compounds in the headspace of the sample jars. All field measurements will be recorded in a field notebook.

LABORATORY ANALYSES

Groundwater samples collected at the Montrose site for analysis of inorganic constituents will be analyzed by BC Laboratories, Bakersfield, California. Groundwater and soil samples will be analyzed for total DDT and its isomers, monochlorobenzene, and chloral by Brown & Caldwell Analytical Laboratories, Pasadena, California. A review of the raw materials used in the DDT manufacturing process (Table 1) indicates two compounds of concern: chloral and monochlorobenzene, which can be detected in a volatile organic analysis. The lignons, silicon dioxide, calcium silicate, gypsum, and talc are common materials and of minimal concern. The Oleum 65% and sodium hydroxide concentrations can be detected by measuring pH in water and soil samples and analyzing for common ions, specifically sulfate and sodium in water samples. Igepon T-77 is a common industrial detergent that is bio-degradable and of no apparent concern.

GROUNDWATER ANALYSES

Groundwater samples from each monitor well will be analyzed for total DDT and its isomers, monochlorobenzene, and chloral. In addition, the water samples will be analyzed for common ions, including calcium, magnesium, silica, sodium, potassium, carbonate, bicarbonate, chloride, sulfate, nitrate, and fluoride. A second set of groundwater samples will be analyzed for these same constituents. Laboratory methods, handling, and preservation requirements for water samples are summarized in Table 2.

SOIL ANALYSES

Selected soil samples from each monitor well will be analyzed for DDT, monochlorobenzene, and chloral. Soil samples will be selected for analysis based on OVA readings, physical appearance, odor, lithology, and estimated moisture content. Soil sample handling, preservation, and analytical methods are summarized in Table 3.

QUALITY ASSURANCE

The objective of a Quality Assurance Program is to provide data for which the limits of uncertainty are known and from which confident conclusions may be drawn. Proper documentation will provide records of traceability and assurance of adherence to prescribed protocols.

The Quality Assurance Program established for this investigation will contain complete documentation records of all sampling activities, including: field measurements and the calibration of instruments; sampling techniques; preservation procedures; sample integrity documentation (blanks, splits, duplicates); chain-of-custody records; packaging, shipping, and handling procedures; analytical methods; and laboratory quality control procedures.

DUPLICATE AND BLANK SAMPLING REQUIREMENTS

Each shipment will contain a blank water sample of deionized water. The blank will be labeled, sealed, and packaged in a manner identical to the other water samples collected. The identity of the blank water sample will be unknown to the laboratory performing the analysis. The blank water sample provides a check for cross-contamination during collection and transportation to the laboratory.

One duplicate sample will be collected during each sampling round. At least one duplicate sample will be collected per day that sampling occurs. The duplicate sample location will be selected in the field and collected, labeled, and sealed in a manner identical to the other water samples. The identity of the duplicate sample will be unknown to the laboratory personnel performing the analysis.

Each shipment will contain a blank soil sample consisting of soil from a remote location. The blank will be labeled, sealed, and packaged in a manner identical to the other soil samples collected. The identity of the blank soil sample will be unknown to the laboratory performing the analysis. The blank soil sample provides a check for cross-contamination during collection and transportation to the laboratory.

Duplicate soil samples will be collected for approximately 10 percent of the soil samples. At least two duplicate samples will be collected from each borehole. The duplicate samples will be collected, labeled, and sealed in a manner identical to the other soil samples. The identity of the duplicate sample will be unknown to the laboratory performing the analysis. Splits of all soil samples will be collected and stored at the laboratory.

SAMPLE HANDLING, PACKAGING, SHIPMENT, AND CHAIN-OF-CUSTODY

The chain-of-custody requirements and the quality control and quality assurance programs in the laboratory require complete, representative, and accurate data. Proper documentation provides records of traceability that ensures a defensible link between sampling and later analytical work.

Each water sample will be labeled in the field with the well name or number, date of sampling, sample time, collector's name and company, and the analyses to be performed. Sample container lids will be secured with tape. All pertinent data concerning each sample will be recorded in a field log book.

The sample collection pesonnel will maintain custody of the samples from the time of collection to the time of shipment. At the end of each sampling day, samples will be transported to the laboratory. The laboratory will preserve the samples according to analytical protocols contained in EPA publications "Test Methods for Evaluating Solid Waste" (July 1982), and "Methods for Organic Chemical Analysis of Municipal and Industrial Waste Water" (July 1982).

Upon receipt at the laboratory, the sample will be assigned a log number for future reference, and an acknowledgement of sample reception will be issued. Transmittal forms, shipment receipts, and sample acknowledgement forms will be filed to complete the chain-of-custody record.

The chain-of-custody documents will comprise the following:

1. Transmittal letter to the laboratory including: an inventory of sample containers shipped, method of shipment, date shipped, signature of laboratory representative with time and date of receipt, and observations on integrity of the samples.

2. Analysis schedule, attached to transmittal letter, including: sample identifier, time and date of collection, type of sample, container used, analysis required, and remarks concerning special handling or storage procedures.

LABORATORY QUALITY ASSURANCE

Standard laboratory quality control procedures include duplicate analyses of approximately 20 percent of the samples, spike recoveries on approximately 10 percent of the samples, and daily method blanks. A control sample with a known concentration is analyzed with each set of samples to ensure the accuracy of the prepared standard used for the particular analysis. Results of the laboratory control and spike recovery samples are measured against norms established by prior laboratory experience. Additional quality control and assurance documentation has been provided by the laboratory **(Appendix A)**.

SITE SAFETY PLAN

Soils at the site are known to contain DDT, predominantly in the upper two feet of soil. The site will be completely paved before the monitor wells are constructed. This paving will eliminate potential exposure of personnel to soil and dust containing DDT, except during the actual drilling and soil sampling operations.

The site safety plan is summarized in Appendix B.

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APPENDIX A

LABORATORY QUALITY CONTROL

BROWN AND CALDWELL
CONSULTING ENGINEERS

ANALYTICAL SERVICES DIVISION

QUALITY ASSURANCE AND CHAIN-OF-CUSTODY

Brown and Caldwell maintains a comprehensive quality assurance program based on guidelines established by the United States Environmental Protection Agency (USEPA)[a]. Our program begins in the field where samples are collected and is carried through each step of the analytical process, report preparation, and final disposition of the samples.

Sample Collection

Advanced planning is essential to the collection of samples. Sampling equipment, appropriate containers and preservatives, and holding times are a few of the considerations which must be made to minimize possibilities for contamination or unnecessary delays which threaten the integrity of the sample. Precision and accuracy are meaningless without the proper collection of a representative sample. Quality assurance starts out with our experienced field personnel. Sample bottles are clearly marked and all pertinent observations recorded along with sample description, time sampled, data sampled, and initials of the collector.

Sample Control

Verification of sample integrity is one of the main responsibilities of our sample control officer. The sample will be inspected to see that it was collected with the following considerations:

1. Sample identification - the sample must be clearly marked and dated.
2. The sample must be collected in the most appropriate container for the individual analysis, whether it be glass, plastic, or a special vial to avoid headspace.
3. The sample must be properly preserved.
4. There must be an adequate volume for all analyses involved.

a) U.S. Environmental Protection Agency Publication 600/4-79-020

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CONSULTING ENGINEERS

ANALYTICAL SERVICES DIVISION

D H CALDWELL PE Chairman
T V LUTGE PE President
R C ABERLEY PE Exec Vice Pres
S A FISHER Vice Pres

If the above conditions are met, the sample will be given a log number and the description, date received, and client's name are all recorded along with any other relevant information. If aliquots or subsamples are to be split, care is taken to ensure that the subsamples are representative of the original. Blending or grinding may be required.

Another major task of the sample control officer is to establish a chain-of-custody. The sample must be accounted for from the time of collection to the time of disposal. Samples are normally held for 30 days after completion of the analyses; however, longer holding periods are negotiable.

Analytical

Brown and Caldwell's analytical quality control procedures require each set of analyses be accompanied by a number of control operations. The results of these data are compared against established norms in order to make sure the analysis is under control.

For example, the analysis of a set of six to ten wastewater samples for, say, ammonia would typically involve the following quality control measures.

- A three-to-four point calibration curve bracketing the concentrations of ammonia in the samples is constructed.
- A method (reagent) blank run is made.
- A laboratory control standard containing a known amount of the analyte in distilled water is determined daily.
- At least one replicate determination is made.
- At least one sample is spiked with a known amount of analyte and the percent recovery calculated.
- Wherever possible, a field blank is analyzed.
- A field replicate is analyzed if available.
- The method detection limit may be redetermined.

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Results for the laboratory control and spike recovery samples are measured against norms established by prior laboratory experience. If either result differs from the expected value by more than three standard deviations, the method is said to be "out of control" - all work is stopped until the problem has been resolved. During the week following an "out of control" situation, quality control checks are made more frequently than the usual 10 to 15 percent.

Results are often confirmed by making use of an alternative method. For instance, calcium may be determined by atomic absorption, ion chromatography, or EDTA titrimetric methods. Volatile fatty acids may be determined by titration of a steam distillate or, with speciation, by gas, high performance liquid or ion chromatography methods. Ammonia may be determined by colorimetric, titrimetric, amperometric, or ion chromatographic methods

Analytical performance is also monitored on a regular basis through the following:

1. Participation in the interlaboratory or round-robin programs
2. Participation in the USEPA's check sample program
3. Analysis of internal blank check samples submitted by the qulaity assurance officer
4. Validation of data by analysis of samples by both Emeryville and Pasadena laboratories, independently

Miscellaneous Checks of Accuracy

Wastewater analyses in particular often provide the analysts with unusual challenges such as interferences not discussed in the standard analytical reference manuals. Such difficulties, which would otherwise escape detection, are often revealed by other frequently applied checks on accuracy. For example, an erroneously high sulfite value was found and corrected in the course of establishing a cation/anion balance.

Where applicable, correlations may be established for total organic carbon, biochemical oxygen demand, chemical oxygen demand, and other parameters. Dissolved solids and conductance often serve as checks against each other. Mass balance calculations will also assist in identifying error if flow rates of a system are known. All of the above considerations are essential to quality assurance in providing an added means of identifying error.

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Where trace analysis is involved, purity of the water, solvents, reagents, and gases employed is of great concern. The highest quality chemicals appropriate for a particular analysis, including solvents especially prepared for pesticide analysis, are used throughout. A well-equipped dishwashing facility provides clean glassware. Glassware used in trace metal analysis is treated with aqua regia while organics glassware is dried in a muffle furnace at 500°C after washing.

Equipment Maintenance

Brown and Caldwell maintains service contracts on all major instrumentation, i.e., gas chromatographs, atomic absorption, ion chromatography, and total organic carbon analyzers are all serviced and maintained regularly. Balances and spectrophotometers are also checked on a regular basis. Programmable calculators are provided to minimize the human error in repetitive calculations.

Chain-of-Custody

Brown and Caldwell's chain-of-custody procedures have been established to document the identity of a sample and its handling from the time of collection until its ultimate disposal.

Proper sample handling techniques begin with a well-planned sample collection program which includes having sample bottles precleaned and labeled. When sample bottles are requested by a client, they are appropriately prepared and preservatives added in advance. This assists in eliminating contamination or degradation of samples.

Sample identification in the field initiates a chain-of-custody record which is provided with the bottles and remains with the sample throughout its handling. This includes the transfer of samples from the field crew to the laboratory and, in some cases where necessary, to the subcontractors' laboratory.

Upon receipt at the laboratory, sample integrity is verified by the sample control officer as discussed above. Each sample is then assigned a discrete log number which will identify the sample recorded in the custody record and in the legally required sample log book maintained at Brown and Caldwell. When samples are received through a carrier, an acknowledgement of sample reception is immediately mailed to the client. However, arrangements are typically made to immediately contact the client by phone if problems are identified.

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Generations of Reports

The sample control officer prepares a work sheet for each sample, based on information recorded in the sample log book. The work sheet is forwarded to the laboratory supervisor who schedules the work upon consultation with the appropriate section head. Upon completion, the results are recorded in a bound analysis log book and on the work sheet. The work sheet is then turned in for typing.

The typed copy is reviewed by both laboratory supervisor and laboratory manager before being sent out to the client. A copy of the results is filed along with the raw data which includes chromatograms, printouts, and quality control information. These are kept on file for a minimum of five years.

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APPENDIX B

SITE SAFETY PLAN

Hargis & Associates, Inc.

APPENDIX B

SITE SAFETY PLAN

A. GENERAL INFORMATION:

Site:	Montrose Chemical Corporation Torrance, California
Location:	13 acres, bounded by Normandie Avenue to the east, a vacant lot to the west, and industrial operations to the south and north, in Torrance, California.
Plan Prepared By:	Hargis & Associates, Inc.
Date:	January 1985
Objective:	To document hydrogeologic conditions beneath the site, direction of groundwater flow, and the chemical character of shallow groundwater; to determine if shallow groundwater contains chemical residues used at the site.
Proposed Date of Investigation:	March 1985
Overall Hazard:	Low

B. SITE AND CHEMICAL CHARACTERISTICS:

Substances of Concern:	DDT, Monochlorobenzene, Chloral
Potential Forms:	Liquid, solid
Characteristics:	Volatile, toxic

Site Description: DDT has been detected in surface soils at the 13 acre site. DDT occurs principally in the upper two feet of soil, with concentrations decreasing rapidly below a depth of two feet. The first water bearing zone occurs approximately 70 feet beneath the site. No contamination of groundwater has been documented.

Unusual Features: None identified

Status: Inactive

History: A wide range of sampling has occurred over the past three years: 50 soil borings drilled on-site; EPA, California DOHS, and California Fish & Game have all sampled just off-site. Several remedial actions have been implemented at the site, including construction of a berm to eliminate potential transport of contaminated sediments via stormwater runoff. The site will be paved before drilling and sampling activities occur.

C. HAZARD EVALUATION:

CONTAMINANT	MAXIMUM LEVEL OBSERVED	PERMISSIBLE EXPOSURE LIMIT*	IDLH LEVEL**	PERSONAL PROTECTION AND SANITATION
DDT	95,000 ppm	1 mg/m^3	NA	Clothing: Wear appropriate clothing to prevent repeated or prolonged skin contact. Goggles: Wear eye protection to reduce probability of eye contact. Wash: Personnel should wash promptly when skin becomes contaminated. Change: Work clothing should be changed daily if it is reasonably probable that the clothing is contaminated. Remove: Promptly remove non-impervious clothing that becomes contaminated.
Monochlorobenzene	NA	75 ppm (350 mg/m^3) ACGIH (TLV)*** 75 ppm	2,400 ppm	Clothing: Wear appropriate clothing to prevent repeated or prolonged skin contact. Goggles: Wear eye protection to prevent reasonalble probability of eye contact. Wash: Personnel should wash promptly when skin becomes wet. Change: NA Remove: Immediately remove any clothing that becomes wet to avoid flammability hazard.

NA = Not applicable
* PEL, as found in 29 CFR 1910.1000 (Jan 1977); work shift time-weighted average (TWA) level.
** Immediately Dangerous to Life or Health
*** American Conference of Governmental Industrial Hygienists, revised threshold limit value (TLV).

CONTAMINANT	HEALTH HAZARDS			
	ROUTE	SYMPTOMS	FIRST AID	TARGET ORGANS
DDT	Inhalation Absorbtion Ingestion Contact	Paresthesias tongue, lips, face; tremor; apprehension, dizziness, confusion; malaise, head; convulsions; paresis hands; vomit; irritation of eyes, skin.	Eye: irrigate immediately. Skin: wash promptly with soap. Breath: artificial respiration. Swallow: Large quantity of water, make conscious person vomit.	Central nervous system, kidneys, liver, skin, peripheral nervous system.
MONOCHLOROBENZENE	Inhalation Ingestion Contact	Irritation to eyes, nose; drowsiness; incoordination; skin irritation; liver damage.	Eye: Irrigate immediately Skin: wash promptly with soap. Breath: Artificial respiration. Swallow: Do not induce vomiting.	Respiratory system, eyes, skin, central nervous system, liver.

FROM: NIOSH/OSHA Pocket Guide to Chemical Hazards, joint publication of Public Health Services, Center for Disease Control, National Institute for Occupational Safety and Health, and Occupational Safety and Health Administration, August 1980.

Exposure Potential: Capping of the site has significantly reduced potential exposure to soils contaminated with DDT. There will be limited direct skin contact with soils during drilling. All drilling and sampling will be conducted outdoors with open air ventilation.

Safety: Heavy equipment use; electrical shock; low accident potential during sampling.

Overall: Low

D. SITE SAFETY WORK PLAN

Perimeter Establishment:

Site Secured: Yes

Perimeter Identified: Yes

Zones of Contamination Identified: Yes

Personal Protection:

Level of Protection: Level D (work uniform, with some modification)

Modifications: Hard hat around drilling rig; steel toed boots; gloves.

Surveillance Equipment and Materials: Organic Vapor Detectors; dust monitors; respirators, if required.

Decontamination procedures: Steam clean rig between monitor wells; clean sampling devices prior to sampling.

Special equipment, facilities, or Procedures: None other than those required for sample collection or field measurements

State of California — Department of Health Service

Memorandum

Montrose file copy

To : Miller Chambers
Los Angeles HMMS

Date : July 21, 1981

Subject: Montrose Chemical Company, 2020 South Normandie Ave.

M

From : Sue Stack
Sue Stack
Abandoned Site Project

Sec. C

Beth Tirey and I recently presented information concerning Montrose Chemical Company to Jim Stahler. Mr. Stahler shares our concern that a "slug" of DDT may be lodged somewhere in the County Sanitation District sewer lines near Montrose; he directed us to contact you so that you would in turn contact the Sanitation District.

Attached is a copy of our summary regarding this abandoned hazardous waste problem. We would appreciate your assistance resolving the question of whether contamination in the sewer line was ever cleaned up. If the Sanitation District cannot produce evidence to show the DDT slug was removed, Abandoned Site Project staff will refer the situation to the Regional Water Quality Control Board and the State Department of Fish and Game.

Thank you for your help. Please respond to either Beth Tirey or me (phone ATSS 473-6042) as soon as possible.

Attachment

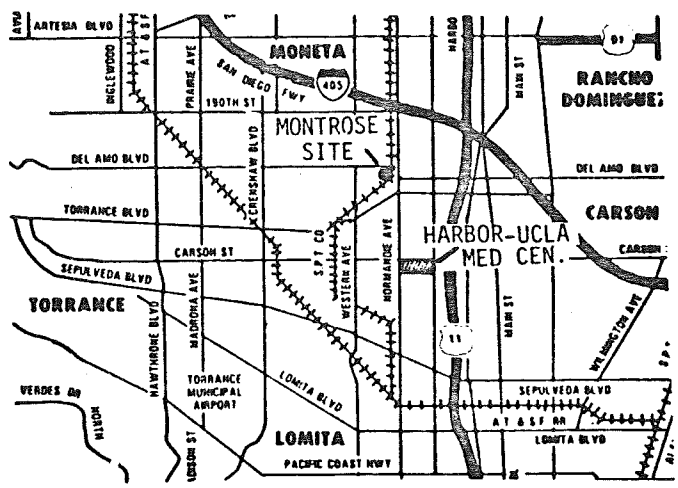
Site Entry Procedures:	Secured fence with locked gate.
Work Limitations:	None
Investigation-derived Material Disposal:	Drill cuttings and discharge waters disposed in accordance with State regulations.

E. EMERGENCY INFORMATION

Ambulance:	328-3131 (paramedics)
Hospital Emergency Room:	Harbor-UCLA Medical Center 1000 West Carson Torrance, California 533-2383
Poison Control Center:	Los Angeles County Medical Assn 484-5151
Police:	3300 Civic Center Drive Torrance, California 320-2611
Fire Department:	1701 Crenshaw Boulevard Torrance, California 328-3131
Airport:	Torrance, California 325-0191
Explosives Unit:	NA
Client Contact:	213/323-2056 (John Kallok)

F. EMERGENCY ROUTES

Hospital:	Harbor-UCLA Medical Center 1000 West Carson Torrance, California 533-2383
Attached Map:	Yes



Facility name: MONTROSE CHEMICAL CORPORATION

Location: TORRANCE, CA

EPA Region: 9

Person(s) in charge of the facility: SAMUEL RPTFPSEN, PRESIDENT

Name of Reviewer: JEFF ROSENBLOOM Date: JUNE 13, 1984

General description of the facility:

(For example: landfill, surface impoundment, pile, container; types of hazardous substances; location of the facility; contamination route of major concern; types of information needed for rating; agency action, etc.)

The Montrose Chemcial Co. manufactured, formulated, ground, and distributed DDT from this location from 1947 to 1982. Documented contamination of surface water and air by DDT exists. The facility is in close proximity (500 feet) to a residential area

33.85 · 12.52 0

Scores: S_M = ~~24.55~~ (S_{gw} = ~~17.35~~ S_{sw} = 19.35 S_a = 53.85)

S_{FE} = 0

S_{DC} = 0

FIGURE 1
HRS COVER SHEET

29070

Rec'd A Platt 6/26/84

Ground Water Route Work Sheet						
Rating Factor	Assigned Value (Circle One)		Multiplier	Score	Max. Score	Ref. (Section)
1 Observed Release	0	45	1		45	3.1
If observed release is given a score of 45, proceed to line 4. If observed release is given a score of 0, proceed to line 2.						
2 Route Characteristics						3.2
Depth to Aquifer of Concern	(0) 1 2 3		2	0	6	
Net Precipitation	0 (1) 2 3		1	1	3	
Permeability of the Unsaturated Zone	(0) 1 2 3		1	0	3	
Physical State	0 1 2 (3)		1	3	3	
Total Route Characteristics Score				4	15	
3 Containment	0 1 2 (3)		1	3	3	3.3
4 Waste Characteristics						3.4
Toxicity/Persistence	0 3 6 9 12 15 (18)		1	18	18	
Hazardous Waste Quantity	0 1 2 3 4 (5) 6 7 8		1	5	8	
Total Waste Characteristics Score				23	26	
5 Targets						3.5
Ground Water Use	0 1 (2) 3		3	6	9	
Distance to Nearest Well/Population Served	0 4 6 8 10 12 16 18 (20) 24 (30) 32 35 40		1	~~30~~ 20	40	
				26		
Total Targets Score				~~35~~	49	
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5			7	176 ~~0~~	57,330	
7 Divide line 6 by 57,330 and multiply by 100			S_{gw} = ~~17.33~~		12.52	

FIGURE 2
GROUND WATER ROUTE WORK SHEET

Surface Water Route Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1 Observed Release	0 (45)	1	45	45	4.1
If observed release is given a value of 45, proceed to line 4. If observed release is given a value of 0, proceed to line 2.					
2 Route Characteristics					4.2
Facility Slope and Intervening Terrain	0 1 2 3	1		3	
1-yr. 24-hr. Rainfall	0 1 2 3	1		3	
Distance to Nearest Surface Water	0 1 2 3	2		6	
Physical State	0 1 2 3	1		3	
Total Route Characteristics Score				15	
3 Containment	0 1 2 3	1		3	4.3
4 Waste Characteristics					4.4
Toxicity/Persistence	0 3 6 9 12 15 (18)	1	18	18	
Hazardous Waste Quantity	0 1 2 3 4 (5) 6 7 8	1	5	8	
Total Waste Characteristics Score			23	26	
5 Targets					4.5
Surface Water Use	0 1 (2) 3	3	6	9	
Distance to a Sensitive Environment	0 1 2 (3)	2	6	6	
Population Served/Distance to Water Intake Downstream	0 4 6 8 10 12 16 18 20 24 30 32 35 40	1	0	40	
Total Targets Score			12	55	
6 If line 1 is 45, multiply 1 x 4 x 5 / If line 1 is 0, multiply 2 x 3 x 4 x 5			12420	64,350	
7 Divide line 6 by 64,350 and multiply by 100		S_{sw} =	19.3		

FIGURE 7
SURFACE WATER ROUTE WORK SHEET

A.P. 6/20/84

Air Route Work Sheet						
Rating Factor	Assigned Value (Circle One)		Multi-plier	Score	Max. Score	Ref. (Section)
1 Observed Release	0	45	1	45	45	5.1
Date and Location: 6 week period during 1974 Torrance Area						
Sampling Protocol: Extract aerial fallout-mineral oil plate.						
If line 1 is 0, the S_a = 0. Enter on line 5. If line 1 is 45, then proceed to line 2.						
2 Waste Characteristics						5.2
Reactivity and Incompatibility	(0) 1 2 3		1	0	3	
Toxicity	0 1 2 (3)		3	9	9	
Hazardous Waste Quantity	0 1 2 3 4 (5) 6 7 8		1	5	8	
Total Waste Characteristics Score				14	20	
3 Targets						5.3
Population Within 4-Mile Radius	0 9 12 15 18 21 24 27 30		1	27	30	
Distance to Sensitive Environment	0 1 2 3		2	0	6	
Land Use	0 1 2 (3)		1	3	3	
Total Targets Score				30	39	
4 Multiply 1 x 2 x 3				18900	35,100	
5 Divide line 4 by 35,100 and multiply by 100			S_a = 53.85			

FIGURE 9
AIR ROUTE WORK SHEET

	S	S^2
Groundwater Route Score (S_{gw})	12.52 ~~11.20~~	156.7504 ~~125.55~~
Surface Water Route Score (S_{sw})	19.30 ~~19.35~~	372.49
Air Route Score (S_a)	53.85	2899.8225 ~~2899.59~~
$S_{gw}^2 + S_{sw}^2 + S_a^2$		3429.0629 ~~3572.21~~
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$		58.5582 ~~59.77~~
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} / 1.73 = S_M =$		33.85 ~~34.55~~

FIGURE 10
WORKSHEET FOR COMPUTING S_M

AP
8/28/84

Direct Contact Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Observed Incident	0 45	1		46	8.1
If line 1 is 45, proceed to line 4 If line 1 is 0, proceed to line 2					
2 Accessibility	0 1 2 3	1		3	8.2
3 Containment	0 15	1		15	8.3
4 Waste Characteristics Toxicity	0 1 2 3	5		15	8.4
5 Targets					8.5
Population Within a ¼-Mile Radius	0 1 2 3 4 5	4		20	
Distance to a Critical Habitat	0 1 2 3	4		12	
	Total Targets Score			32	
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5				21,600	
7 Divide line 6 by 21,600 and multiply by 100		S_{DC} =			

FIGURE 12
DIRECT CONTACT WORK SHEET

Fire and Explosion Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Containment	1 3	1		3	7.1
2 Waste Characteristics					7.2
Direct Evidence	0 3	1		3	
Ignitability	0 1 2 3	1		3	
Reactivity	0 1 2 3	1		3	
Incompatibility	0 1 2 3	1		3	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1		8	
Total Waste Characteristics Score				20	
3 Targets					7.3
Distance to Nearest Population	0 1 2 3 4 5	1		5	
Distance to Nearest Building	0 1 2 3	1		3	
Distance to Sensitive Environment	0 1 2 3	1		3	
Land Use	0 1 2 3	1		3	
Population Within 2-Mile Radius	0 1 2 3 4 5	1		5	
Buildings Within 2-Mile Radius	0 1 2 3 4 5	1		5	
Total Targets Score				24	
4 Multiply 1 x 2 x 3				1,440	
5 Divide line 4 by 1,440 and multiply by 100		S_{FE} =			

FIGURE 11
FIRE AND EXPLOSION WORK SHEET

DOCUMENTATION RECORDS
FOR
HAZARD RANKING SYSTEM

INSTRUCTIONS: The purpose of these records is to provide a convenient way to prepare an auditable record of the data and documentation used to apply the Hazard Ranking System to a given facility. As briefly as possible summarize the information you used to assign the score for each factor (e.g., "Waste quantity = 4,230 drums plus 800 cubic yards of sludges"). The source of informaton should be provided for each entry and should be a bibliographic-type reference that will make the document used for a given data point easier to find. Include the location of the document and consider appending a copy of the relevant page(s) for ease in review.

FACILITY NAME: Montrose Chemical Company

LOCATION: Torrance, California

Grid
APlat
11/26/84

GROUND WATER ROUTE

1 OBSERVED RELEASE

Contaminants detected (5 maximum):

Rationale for attributing the contaminants to the facility:

***

2 ROUTE CHARACTERISTICS

Depth to Aquifer of Concern

Name/description of aquifers(s) of concern:

(Ref.1) The Silverado Aquifer is the aquifer of concern since it is tapped by the Dominguez Water Corporation.

Depth(s) from the ground surface to the highest seasonal level of the saturated zone [water table(s)] of the aquifer of concern:

(Ref.2) The Silverado Aquifer is approximately 400 feet below ground level (in the vicinity of the site).

Depth from the ground surface to the lowest point of waste disposal/ storage:

(Ref.7) The DDT contamination is seen at depths of 5 feet.

Depth from waste to aquifer is:
400 ft. - 5 ft = 395 ft. SCORE = 0

4/26/84

Net Precipitation

Mean annual or seasonal precipitation (list month for seasonal):

ef.3) Precipitation in December averaged from 1931 to 1955 is 4.25 inches.

Mean annual lake or seasonal evaporation (list months for seasonal):

ef.3) Evaporation in December averaged from 1947 to 1973 is 1.77 inches..

Net precipitation (subtract the above figures):

Net precipitation in December is ~~2.58~~ 2.48 inches

SCORE = 1

Permeability of Unsaturated Zone

Soil type in unsaturated zone:

ef.4) Fine sand, brown sandy clay, clay and silt lenses

Permeability associated with soil type:

The least permeable materials is clay.

SCORE = 0

Physical State

Physical state of substances at time of disposal (or at present time for generated gases):

ef.5) The DDT was disposed of in both a liquid and powder form. The higher score will be for liquid disposal.

SCORE = 3

***

AP 6/26/84

3 CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

ef.5) There is no observed means of waste contaminent. DDT seems to have been spread over the site.

Method with highest score:

No contaminent

SCORE = 3

4 WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated:

:f.7) DDT

Compound with highest score:

:f.6,7) DDT. Toxicity and Persistence both score a three (maximum).

SCORE = 18

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (Give a reasonable estimate even if quantity is above maximum):

f.7) 340 ~~cubic yards~~ tons of DDT SCORE = 5

Basis of estimating and/or computing waste quantity:

~~See Reference~~ Calculation by Metcalf and Eddy, Inc., based on DDT concentrations in on-site soils.

***

4

AP 6/24/84

5 TARGETS

Ground Water Use

Use(s) of aquifer(s) of concern within a 3-mile radius of the facility:

(Ref.1) The Dominguez Water Corp. uses the Silverado Aquifer (via Well No. 19) as ~~an alternative~~ a primary water (drinking) supply. However, alternative supplies are available. SCORE = 2

Distance to Nearest Well

Location of nearest well drawing from aquifer of concern or occupied building not served by a public water supply:

(Ref.8) Well No. 19 is on Carson Street, just west of Grace Avenue

Distance to above well or building:

Well No. 19 is approximately 2 ~~1.99~~ miles from the site

Population Served by Ground Water Wells Within a 3-Mile Radius

Identified water-supply well(s) drawing from aquifer(s) of concern within a 3-mile radius and populations served by each:

(Ref.1) Well No. 19

Computation of land area irrigated by supply well(s) drawing from aquifer(s) of concern within a 3-mile radius, and conversion to population (1.5 people per acre):

Total population served by ground water within a 3-mile radius:

(Ref.1) Well No. 19 water is blended into this system. There are 26,000 connections. At 3.8 people/conn. - total population served is 98,800

SCORE = 20 ~~30~~

AP 12/6/84

SURFACE WATER ROUTE

1 OBSERVED RELEASE

Contaminants detected in surface water at the facility or downhill from it (5 maxiumum):

(Ref.9) DDT - detected by the Los Angeles Regional Water Quality Control Board

SCORE = 45

Rationale for attributing the contaminants to the facility:

(Ref. 9, 10) ~~DDT was found on the site in very high concentrations. There is no background levels of DDT in the surface water run-off this water is the result of rain and the run-off originates on the site.~~ Sewer sediments at two stations downstream of Montrose contained DDT at 16.5 and 13 ~~percent~~ percent, respectively, compared to 0.03 percent upstream of Montrose. DDT contamination has been detected in Dominguez Canal and Los Angeles Harbor.

2 ROUTE CHARACTERISTICS

Facility Slope and Intervening Terrain

Average slope of facility in percent:

Name/description of nearest downslope surface water:

Average slope of terrain between facility and above-cited surface water body in percent:

Is the facility located either totally or partially in surface water?

AC 11/26/84

Is the facility completely surrounded by areas of higher elevation?

1-Year 24-Hour Rainfall in Inches

Distance to Nearest Downslope Surface Water

Physical State of Waste

***

3 CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

Method with highest score:

AP 1/26/94

4 WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated

SEE GROUNDWATER

Compound with highest score:

SEE GROUNDWATER

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (Give a reasonable estimate even if quantity is above maximum):

SEE GROUNDWATER

Basis of estimating and/or computing waste quantity:

SEE GROUNDWATER

***

5 TARGETS

Surface Water Use

Use(s) of surface water within 3 mile downstream of the hazardous substance:

f.10) The surface water run-off is easily accesible by the public - as
f.13) seen in photo. ~~The water is not used as a drinking water source~~.
This run-off ends up in the Dominguez channel and the L.A. Harbor
which are both used for recreation SCORE = 2

AP
6/26/84

Is there tidal influence?

Distance to a Sensitive Environment

Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:

(Ref.13) DDT from the Montrose facility ends up in the Dominguez channel and then to the L.A. Harbor. Both the harbor and channel contain wildlife and rare species.

Distance to 5-acre (minimum) fresh-water wetland, if 1 mile or less:

Distance to critical habitat of an endangered species or national wildlife refuge, if 1 mile or less:

Population Served by Surface Water

Location(s) of water-supply intake(s) within 3 miles (free-flowing bodies) or 1 mile (static water bodies) downstream of the hazardous substance and population served by each intake:

AP 12/5/84

Computation of land area irrigated by above-cited intake(s) and conversion to population (1.5 people per acre):

Total population served:

Name/description of nearest of above water bodies:

Distance to above-cited intakes, measured in stream miles.

AP
6/26/81

AIR ROUTE

1 OBSERVED RELEASE

Contaminants detected:

(Ref.11) DDT, ~~DDA, DDE~~ DDE, DDD

SCORE = 45

Date and location of detection of contaminants

~~Six week period during 1981. Air sampling was done on the site and over an extensive area - see map in Reference 11.~~
Soil samples taken 12/14/83 in nearby residential areas compared to control/background sample 2½ miles to the South

Methods used to detect the contaminants:

~~Mineral oil plates were used for detection~~
Off-Site Soil sampling

Rationale for attributing the contaminants to the site:

Site was the only place where DDT was manufactured. DDT was banned from use in 1972, but Montrose Chem. Co continued production until 1982. ~~Landfills show high levels of DDT because soil from the site was taken to these landfills.~~

***

2 WASTE CHARACTERISTICS

Reactivity and Incompatibility

Most reactive compound:

DDT

Most incompatible pair of compounds:

None

SCORE = 0

AP 05/21/84

Toxicity

Most toxic compound:

ef.6) DDT

SCORE = 3

Hazardous Waste Quantity

Total quantity of hazardous waste:

SEE GROUNDWATER

Basis of estimating and/or computing waste quantity:

SEE GROUNDWATER

***

3 TARGETS

Population Within 4-Mile Radius

Circle radius used, give population, and indicate how determined:

0 to 4 mi 0 to 1 mi 0 to 1/2 mi 0 to 1/4 mi

ef.12)

McDonald Douglas employees	2300	
Farmer Bros. employees	350	
1/2 of houses within 1/4 mile	380	(100 houses at 3.8 people/house)
	3030	

This figure does not include workers to the west of the facility.

SCORE=27

Distance to a Sensitive Environment

Distance to a 5-acre (minimum) coastal wetland, if 2 miles or less:

Distance to 5-acre (minimum) fresh-water wetland, if 1 mile or less:

Distance to critical habitat of an endangered species, if 1 mile or less:

Land Use

Distance to commercial/industrial area, if 1 mile or less:

(Ref.12) Industrial park is located 500 feet from the site

SCORE = 3

Distance to national or state park, forest, or wildlife reserve, if 2 miles or less:

Distance to residential area, if 2 miles or less:

Distance to agricultural land in production within past 5 years, if 2 miles or less:

Is a historic or landmark site (National Register or Historic Places and National Natural Landmarks) within the view of the site?

AP 1/26/84

MONTROSE CHEMCIAL COMPANY-REFERENCES

REFERENCE	SOURCE
1	ROC-Dominguez Water Corporation
2	Hydrogeological Assessment Ecology and Environment TDD #R9-8310-01 November 11, 1983
3	Department of Water Resources Bulletin 73-1 Weather Atlas of the United States Department of Commerce
4	See 2
5	ROC-Field Investigations Section
6	ROC-MITRE Corporation
7	Metcalf and Eddy Transmittal June 13, 1984
8	Review of Proposed Response to EPA Enforcement Order No.83-01 Metcalf and Eddy November 1983
9	See 8
10	Investigation Report-Montrose Chemical Corporation EPA-Region 9 C(83)E002
11	~~See 10~~
12	Photographic Analysis of Four California Hazardous Waste Study Sites TS-AMD-81070 September 1981
13	See 10

California Department of Health Services, Hazardous Materials Laboratory, Laboratory Report, 12/29/83.

Facility name: MONTROSE CHEMICAL CORPORATION

Location: TORRANCE, CA

EPA Region: 9

Person(s) in charge of the facility: SAMUEL ROTROSEN, PRESIDENT

Name of Reviewer: JEFF ROSENBLOOM Date: FEBRUARY 24, 1984

General description of the facility:

(For example: landfill, surface impoundment, pile, container; types of hazardous substances; location of the facility; contamination route of major concern; types of information needed for ranking; agency action, etc.)

Facility manufactured, formulated, ground, and distributed DDT at this location from 1947 to 1982. Documented contamination of surface water and air. Facility is in close proximity (500 ft) to residential area.

Scores: $S_M = 31.74$ ($S_{GW} = 20.72$ $S_{SW} = 9.32$ $S_a = 50.00$)

S_{FE} =

S_{DC} =

FIGURE 1
HRS COVER SHEET

Ground Water Route Work Sheet

Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Observed Release	(0) 45	1	0	45	3.1
If observed release is given a score of 45, proceed to line 4. If observed release is given a score of 0, proceed to line 21.					
2 Route Characteristics					3.2
REF. 1,2,7 .... Depth to Aquifer of Concern	(0) 1 2 3	2	0	6	
REF. 3 ..... Net Precipitation	0 (1) 2 3	1	1	3	
REF. 4 ..... Permeability of the Unsaturated Zone	0 (1) 2 3	1	1	3	
REF. 5 ..... Physical State	0 1 2 (3)	1	3	3	
Total Route Characteristics Score			5	15	
REF. 5 ..... 3 Containment	0 1 2 (3)	1	3	3	3.3
4 Waste Characteristics					3.4
REF. 6,7 ..... Toxicity/Persistence	0 3 6 9 12 15 (18)	1	18	18	
REF. 7 ..... Hazardous Waste Quantity	0 1 2 3 (4) 5 6 7 8	1	4	8	
Total Waste Characteristics Score			22	26	
5 Targets					3.5
REF. 1 ..... Ground Water Use	0 1 (2) 3	3	6	9	
REF. 8 ..... Distance to Nearest Well/Population Served	0 4 8 12 16 20 24 (28) 32 36 40	1	30	40	
Total Targets Score			36	49	
6 If line 1 is 45, multiply 1 x 4 x 5. If line 1 is 0, multiply 2 x 3 x 4 x 5			11,880	57,330	
7 Divide line 6 by 57,330 and multiply by 100		S_{gw} =	20.72		

FIGURE 2
GROUND WATER ROUTE WORK SHEET

Surface Water Route Work Sheet						
Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
REF. 7,9.. 1 Observed Release	0 (45)	1	45	45	4.1
If observed release is given a value of 45, proceed to line 4. If observed release is given a value of 0, proceed to line 2.					
2 Route Characteristics					4.2
Facility Slope and Intervening Terrain	0 1 2 3	1		3	
1-yr. 24-hr. Rainfall	0 1 2 3	1		3	
Distance to Nearest Surface Water	0 1 2 3	2		6	
Physical State	0 1 2 3	1		3	
Total Route Characteristics Score				15	
3 Containment	0 1 2 3	1		3	4.3
4 Waste Characteristics					4.4
REF. 6,7..... Toxicity/Persistence	0 3 6 9 12 15 (18)	1	18	18	
REF. 7..... Hazardous Waste Quantity	0 1 2 3 (4) 5 6 7 8	1	4	8	
Total Waste Characteristics Score			22	26	
5 Targets					4.5
REF. 10..... Surface Water Use	0 1 (2) 3	3	6	9	
Distance to a Sensitive Environment	(0) 1 2 3	2	0	6	
Population Served/Distance to Water Intake Downstream	(0) 4 6 8 10 12 16 18 20 24 30 32 35 40	1	0	40	
Total Targets Score			6	55	
6 If line 1 is 45, multiply 1 x 4 x 5. If line 1 is 0, multiply 2 x 3 x 4 x 5			5940	64,350	
7 Divide line 6 by 64,350 and multiply by 100	S_{SW} = 9.23				

FIGURE 7
SURFACE WATER ROUTE WORK SHEET

Air Route Work Sheet

	Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. Section
REF. 11	1. Observed Release	0 (45)	1	45	45	5.1
	Date and Location: 6 week period during 1974 Torrance Area					
	Sampling Protocol: Extract aerial fallout-mineral oil plate.					
	If line 1 is 0, the S_a = 0. Enter on line 5. If line 1 is 45, then proceed to line 2.					
	2. Waste Characteristics					5.2
REF. 16	Reactivity and Incompatibility	(0) 1 2 3	1	0	3	
REF. 6	Toxicity	0 1 2 (3)	3	9	9	
REF. 7	Hazardous Waste Quantity	0 1 2 3 (4) 5 6 7 8	1	4	8	
	Total Waste Characteristics Score			13	20	
	3. Targets					5.3
REF. 12	Population Within 4-Mile Radius	0 9 12 15 18 21 24 (27) 30	1	27	30	
	Distance to Sensitive Environment	0 1 2 3	2	0	6	
REF. 12	Land Use	0 1 2 (3)	1	3	3	
	Total Targets Score			30	39	
	4. Multiply 1 x 2 x 3			17,550	35,100	
	5. Divide line 4 by 35,100 and multiply by 100			S_a = 50.00		

FIGURE 9
AIR ROUTE WORK SHEET

	s	s^2
Groundwater Route Score (S_{gw})	20.72	429.32
Surface Water Route Score (S_{sw})	9.32	85.19
Air Route Score (S_a)	50.00	2500.00
$S_{gw}^2 + S_{sw}^2 + S_a^2$		3014.51
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$		54.90
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} / 1.73 = S_M =$		31.74

FIGURE 10
WORKSHEET FOR COMPUTING S_M

Fire and Explosion Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Containment	1 3	1		3	7.1
2 Waste Characteristics					7.2
Direct Evidence	0 3	1		3	
Ignitability	0 1 2 3	1		3	
Reactivity	0 1 2 3	1		3	
Incompatibility	0 1 2 3	1		3	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1		8	
Total Waste Characteristics Score				20	
3 Targets					7.3
Distance to Nearest Population	0 1 2 3 4 5	1		5	
Distance to Nearest Building	0 1 2 3	1		3	
Distance to Sensitive Environment	0 1 2 3	1		3	
Land Use	0 1 2 3	1		3	
Population Within 2-Mile Radius	0 1 2 3 4 5	1		5	
Buildings Within 2-Mile Radius	0 1 2 3 4 5	1		5	
Total Targets Score				24	
4 Multiply 1 x 2 x 3				1,440	
5 Divide line 4 by 1,440 and multiply by 100			Sfe =		

FIGURE 11
FIRE AND EXPLOSION WORK SHEET

Direct Contact Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1 Observed Incident	0 45	1		45	3.1
If line 1 is 45, proceed to line 4 If line 1 is 0, proceed to line 2					
2 Accessibility	0 1 2 3	1		3	3.2
3 Containment	0 15	1		15	3.3
4 Waste Characteristics Toxicity	0 1 2 3	5		15	3.4
5 Targets					3.5
Population Within a 1-Mile Radius	0 1 2 3 4 5	4		20	
Distance to a Critical Habitat	0 1 2 3	4		12	
Total Targets Score				32	
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5				21,600	
7 Divide line 6 by 21,600 and multiply by 100			3.00 =		

FIGURE 12
DIRECT CONTACT WORK SHEET

STATE OF CALIFORNIA — GEORGE DEUKMEJIAN, *Governor*

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD—
LOS ANGELES REGION
107 SOUTH BROADWAY, SUITE 4027
LOS ANGELES, CALIFORNIA 90012-4596
(213) 620-4460

2935

October 29, 1985

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
Claim No. 146712

Mr. Samuel Rotrosen, President
Montrose Chemical Corporation of
California
One Metro Plaza, Suite 301
505 Thornall Street
Edison, New Jersey 08837

OCT 31 1985

CLEAN UP AND ABATEMENT ORDER NO. 85-3

Transmitted herewith is Clean Up and Abatement Order No. 85-3, dated October 29, 1985, in which the requirements of this Regional Board are prescribed to the Montrose Corporation. This Order follows that of the Environmental Protection Agency Docket No. 85-4, which has been signed on October 28, 1985.

This Order calls for reports to the Board giving the details of the ordered work.

If you have any questions, please call Hank Yacoub at (213) 620-4397.

Robert P. Ghirelli

ROBERT P. GHIRELLI, D.Env.
Executive Officer

HHY/pml

cc: Ms. Alexis Strauss, Environmental Protection Agency
Ms. MaryEtta Marks, State Water Resources Control Board, Office of Chief Counsel
Mr. Angelo Bellomo, Department of Health Services, Toxic Substances Control Division
Regional Board Members

STATE OF CALIFORNIA GEORGE DEUKMEJIAN, Governor

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD—
LOS ANGELES REGION
107 SOUTH BROADWAY, SUITE 4027
LOS ANGELES, CALIFORNIA 90012-4596
(213) 620-4460

October 29, 1985

CLEAN UP AND ABATEMENT ORDER NO. 85-3

The California Regional Water Quality Control Board, Los Angeles Region, finds:

1. Montrose Chemical Corporation of California (Montrose) owned and/or operated a facility at 20201 South Normandie Avenue in Torrance, California, for the manufacture and distribution of dichlorodiphenyl trichlorethane (DDT). The plant operated from 1947 to 1982. Production of DDT has ceased, and Montrose dismantled this facility in 1982.

2. The California Department of Health Services approved the RCRA Closure Plans and Procedures submitted by Montrose in August 1982. The Closure Plan addressed only the dismantling and disposal of storage tanks and their contents at BKK, former Class 1 landfill in West Covina, California. However, the discharge of DDT-contaminated rainfall runoff from the facility was not addressed and remained unabated.

3. The discharge of DDT-contaminated rainfall runoff from the facility and adjacent property, its effects on Dominguez Channel waters and subsequently Consolidated Slip waters and sediments, is a condition of pollution which will not be abated until appropriate remedial measures are taken. In February 1985, Montrose regraded the site and paved it with asphalt. This cap was not approved by EPA or the Regional Board. The extent to which the temporary asphalt capping of the site has prevented contamination runoff from leaving the site has yet to be determined. Runoff from the adjacent property is not affected by the capping.

4. Montrose is the only facility which has manufactured DDT in the area tributary to the Torrance Lateral of Dominguez Channel and to Consolidated Slip.

5. Storm runoff from the plant property drains through a narrow, unlined channel, ponds, and then overflows into a catch basin approximately 500 feet from the plant. Water in the catch basin flows to Los Angeles County Flood Control District's (LACFCD's) Torrance Lateral which drains into the Dominguez Channel, and ultimately into Consolidated Slip of Los Angeles Harbor.

6. The Water Quality Control Plan for Los Angeles River Basin specifies that:

"No individual pesticide or combination of pestidices shall be present in concentrations that adversely affect beneficial uses. There shall be no increase in pesticide concentrations found in bottom sediments or aquatic life.

All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the Regional Board."

The Environmental Protection Agency has established ambient water quality criteria to protect human health and aquatic life, as follows:

"For DDT and its metabolites the criterion to protect saltwater aquatic life as derived using EPA Guidelines is 0.0010 ug/1 (ppb) as a 24 hour average and the concentration should not exceed 0.13 ug/1 at any time.

For the maximum protection of human health from the potential carcinogenic effects due to exposure of DDT through ingestion of contaminated water and contaminated aquatic organisms, the ambient water concentration should be zero, based on the non-threshold assumption for this chemical.

For consumption of aquatic organisms, excluding consumption of water, the levels required for human protection are 0.00024 ug/1 (ppb) 0.000024 ug/1 and 0.0000024 ug/1, respectively."

EPA's Ambient Water Quality Criteria document states that for the protection of human health, the maximum level for exposure to monochlorobenzene (MCB) is 488 ug/1. The acute toxicity to freshwater aquatic life occurs at 250 ppb. Monochlorobenze was used in the manufacture of DDT at the Montrose site.

7. Soil and water samples from the drainage path on Montrose and adjacent property collected on November 23, 1981, by California Department of Fish and Game staff showed total DDT concentrations as high as 1,410 parts per billion (ppb) in water and 8,274 parts per billion (ppb) in soil.

8. On November 9 and 10, 1982, Environmental Protection Agency staff collected water samples downstream of the facility as well as adjacent off-site soil samples. Water samples showed concentrations of 209 to 306 ppb total DDT leaving the site and 695 ppb in water ponded off-site. Total DDT concentrations in adjacent offsite soils were as high as 1,900 parts per million (ppm).

9. The Los Angeles County Flood Control District has collected water samples from Torrance Lateral at Main Street, a tributary to Dominguez Channel, since 1977. Both storm and dry weather samples are taken. During the period 1977-1982, the average dry weather concentration of total DDT was 0.75 ppb as compared with average wet weather concentrations of 5.88 ppb. Maximum storm water total DDT concentrations have been as high as 35 ppb.

10. The California State Mussel Watch is a marine monitoring program conducted by the California Department of Fish and Game for the State Water Resources Control Board. The Mussel Watch program in Los Angeles-Long Beach Harbors in 1980 revealed elevated levels of DDT in mussels at various stations in the harbors. In 1981, analysis of mussels taken in Consolidated Slip (L.A. Harbor) at the terminus of the Dominguez Channel showed a concentration of 2,395 ppb total DDT. In 1983, the concentration of DDT was 2,231 ppb and in January 1985 the concentration was 1,017 ppb.

11. During the course of manufacture, handling and distribution of DDT, residues of this material were intentionally or negligently deposited on and in the soils at various locations at the Montrose facility and adjacent properties where stormwater could come in contact with these residues and carry them off the property.

12. Runoff containing contaminants, including DDT and MCB, was also directed to a waste settling and recycling pond located in the process area. The results of recent soil and groundwater investigations by Montrose and the Regional Board indicate high levels of contamination in the soil and perched groundwater in the waste pond settling area.

13. In 1983, EPA and the Regional Board issued enforcement orders to Montrose, requiring Montrose to immediately abate the surface and sediment runoff from the site, and to conduct on and offsite soil sampling. Results of the soil samples indicated that DDT was present in soils onsite at levels from 1,000 to 95,000 parts per million at depths varying from 0-24 inches. Offsite soil DDT concentrations varied from 210 to 1,900 parts per million at depths varying from 0-26 inches.

    These results indicate that DDT was released from the site via surface water and sediment. However, there was no data presented to determine whether DDT had reached the groundwater under the site.

14. The Montrose site was proposed for inclusion on the National Priorities List in October 1984. EPA subsequently developed a Remedial Investigation/Feasibility Study (RI/FS) Work Plan that expanded the earlier study and required the drilling of wells on the property for groundwater sampling. Regional Board staff reviewed the Work Plan and concluded that completion of the tasks contained therein would also satisfy the requirements of this order.

15. Montrose conducted a soil boring and drilled five wells onsite in April 1985, in partial compliance with the RI/FS workplan. Results from these soil borings showed substantial levels of DDT and monochlorobenzene (MCB) in the deep soils near the former waste settling pond. The water table was encountered at approximately 70 feet.

16. Soil borings from well number MW2 at 76.5-77 feet showed an MCB concentration of 7,400 parts per million, and a DDT level of 4,977 parts per million.

The soil boring from a point adjacent to the waste pond exhibited a concentration of MBC of 2,900 ppm and a DDT level of 5,019 parts per million at a depth of 51.5 to 52.0 feet.

17. Results from groundwater samples taken from the Montrose wells by the Regional Board on August 13, 1985, indicate that the shallow groundwater beneath the site is contaminated with DDT. Elevated DDT levels are evident in MW2, which is adjacent to the former waste pond settling area, as indicated below:

Sample Date	7-02-85	8-13-85	
Well No.	Total DDT (mg/l or ppm)	Total DDT (mg/l or ppm)	MCB (mg/l or ppm)
MW1	0.0237	0.0235	14.000
MW2	60.5970	57.997	237.000
MW3	0.0524	0.0048	0.005
MW4	n.a.*	0.0003	0.085
MW5	n.a.*	0.251	107.000

* Not Analyzed

The site is located on the coastal plain in a groundwater basin known as the west plain or the west coast basin. The basin consists of a series of aquifers: the Bellflower Aquitard (located from 63 feet to an unknown depth below site) and the Gage Aquifer (located from approximately 120 to 180 feet below site) comprise the Lakewood formation and the Lynwood and Silverado Aquifers (located approximately from 240 to 700 feet below the site, separated by clay and sandy clay aquitards) comprise the San Pedros Formation. The Bellflower Aquitard and Gage Aquifer may be hydraulically connected. The Gage, Lynwood, and Silverado Aquifers are used for drinking water supply, industry, and irrigation purposes.

18. The existing presence of DDT and MCB residues in soil and groundwater causes or threatens to cause a condition of pollution because they could be carried to waters of the State. This material could be harmful to persons or animals.

19. The discharge of pollutants to waters of the State except as authorized pursuant to waste discharge requirements, is prohibited by Section 13376 of the California Water Code. Montrose Chemical corporation does not have valid waste discharge requirements which would authorize a discharge of pollutants.

20. This enforcement action is being taken for the protection of the environment and as such is exempt from the provisions of the California Environmental Quality Act (Public Resources Code, Section 21000, et seq.) in accordance with Section 15121, Chapter 3, Title 14, California Administrative Code.

21. EPA issued an Administrative Order on Consent (U.S. EPA docket No. 85-04), to Montrose mandating that the scope of the RI/FS must be expanded to investigate the extent of deep soil and groundwater contamination, and the Remedial Investigation presently planned must be fully implemented. This consent order was signed by EPA and Montrose on October 28, 1985.

CLEANUP AND ABATEMENT ORDER
ORDER NO. 85-3

1. Cleanup and Abatement Order No. 83-1, issued by the Executive Officer on May 27, 1983 is hereby rescinded.

2. The California Regional Water Quality Control Board, Los Angeles Region, in accordance with Section 13304 of the California Water Code does hereby order Montrose Chemical Corporation of California to cease the discharge of DDT-contaminated stormwater, clean up these contaminated soils on Montrose and adjacent property and the underlying groundwater, and to abate the effects thereof forthwith. The Clean Up shall include:

   (a) An expanded workplan approved by the Executive Officer to delineate the horizontal and vertical extent of DDT and MCB in soils and groundwater on Montrose and adjacent property.

   (b) Remedial action which may involve the removal of soil contaminated with DDT and/or MCB disposal of it at a Class I disposal site. The results of all soil and groundwater tests shall be submitted for approval, and the extent of soil and groundwater cleanup shall be subject to approval by the Executive Officer of the Board.

3. Montrose Chemical Corporation is hereby directed to submit in writing a revised work plan to conduct a comprehensive sampling program to identify (1) the extent to which surface soils, subsurface soils, and groundwater both on and off Montrose property, have been contaminated with DDT and MCB. The plan is to be implemented only after approval by the Executive Officer of the Board. The plan must incorporate all of the tasks detailed in EPA's Administrative Order on Consent (U.S. EPA Docket No. 85-04) and in the EPA Remedial Investigation/Feasibility (RIFS) Work Plan.

4. Copies of all revised work plans, technical reports, written progress reports and other documents required by EPA in the Administrative Order On Consent (85-04) and in the Remedial Investigation/Feasibility Study Work Plan, shall be submitted to the Executive Officer at the time they are submitted to EPA. The Executive Officer will review the work-plans, written reports, and documents showing the data and findings of the remedial investigation and will transmit to EPA the results of that review, including specific remedial measures to be implemented by Montrose.

5. Failure to comply with the terms or conditions of this order may result in this matter being referred to the Attorney General of the State of California for such legal action as he may deem appropriate.

Robert P. Ghirelli

ROBERT P. GHIRELLI, D.Env.
Executive Officer

October 29, 1985
Date

CALIFORNIA—HEALTH AND WELFARE AGENCY GEORGE DEUKMEJIAN, Governor

DEPARTMENT OF HEALTH SERVICES
107 SOUTH BROADWAY, ROOM 7128
ANGELES, CA 90012
(...5) 620-2380

March 30, 1984

Ms. Alexis I. Strauss
Toxics and Waste Management
Division (T-4)
Environmental Protection Agency
Region IX
215 Fremont Street
San Francisco, CA 94105

Dear Ms. Strauss:

MONTROSE CHEMICAL CORP. SITE - TORRANCE, CALIFORNIA

This will confirm our discussion on March 12, 1984, regarding this Department's comments on the mitigation plans for the subject site. The following points are presented for your information.

- This Department believes that all available options for the site must receive full evaluation prior to selection of the final mitigation alternative. This must be done without bias to the in situ encapsulation of the contaminated soils proposed by Montrose.

- We prefer total removal of all DDT-contaminated soils or partial removal down to an agreed-upon background level.

- In our review of the subject case, we find that existing site information is inadequate to define the nature and extent of the problem. Thus, a comprehensive site characterization should be undertaken before additional discussions on the mitigation options resume. The characterization must include assessment of off-site contamination by DDT and its derivatives, and an evaluation of local groundwater quality.

As discussed, we are initiating steps to control site activities until such time final mitigation is implemented. In this regard, a Notice of Violation and Directive to Comply was issued to Montrose on March 26, 1984.

We will continue to work with you on this matter and will apprise you of developments concerning our directive. If you have questions, please call Mr. Nestor Acedera of this office.

Sincerely,

Angelo Bellomo, Chief
Southern California Section
Toxic Substances Control Division

cc: See attached list

cc: Bob Ghirelli
Regional Water Quality Control Board
107 South Broadway, Room 4027
Los Angeles, CA 90012

Anastacio Medina
Los Angeles County Health
2615 South Grand Avenue, 6th Floor
Los Angeles, CA 90007

Ed Camarena
South Coast Air Quality
Management District
9150 Flair Drive
El Monte, CA 91731

STATE OF CALIFORNIA—HEALTH AND WELFARE AGENCY GEORGE DEUKMEJIAN, Governor

DEPARTMENT OF HEALTH SERVICES
107 SOUTH BROADWAY, ROOM 7128
LOS ANGELES, CA 90012
(213) 620-2380

July 6, 1984

Ms. Alexis Strauss (T-4-2)
U.S. EPA - Region IX
Toxics and Waste
Management Division
215 Fremont Street
San Francisco, CA 94105

Dear Ms. Strauss:

MONTROSE, TORRANCE, CALIFORNIA REMEDIAL INVESTIGATION WORKPLAN

We have completed our review of subject workplan and have no significant comments. We find the plan to be comprehensive and addresses all areas of concern to us. The products of the activities under this workplan should provide the agencies good basis for making decisions concerning the site's mitigation.

We do make the following suggestions:

1. The scope of the off-site sampling should be expanded to identify the extent of migration for the target chemical contaminants.

2. The Hydrogeologic Investigation, Part I (p 2-15), should include permeability testing of the drilling cores.

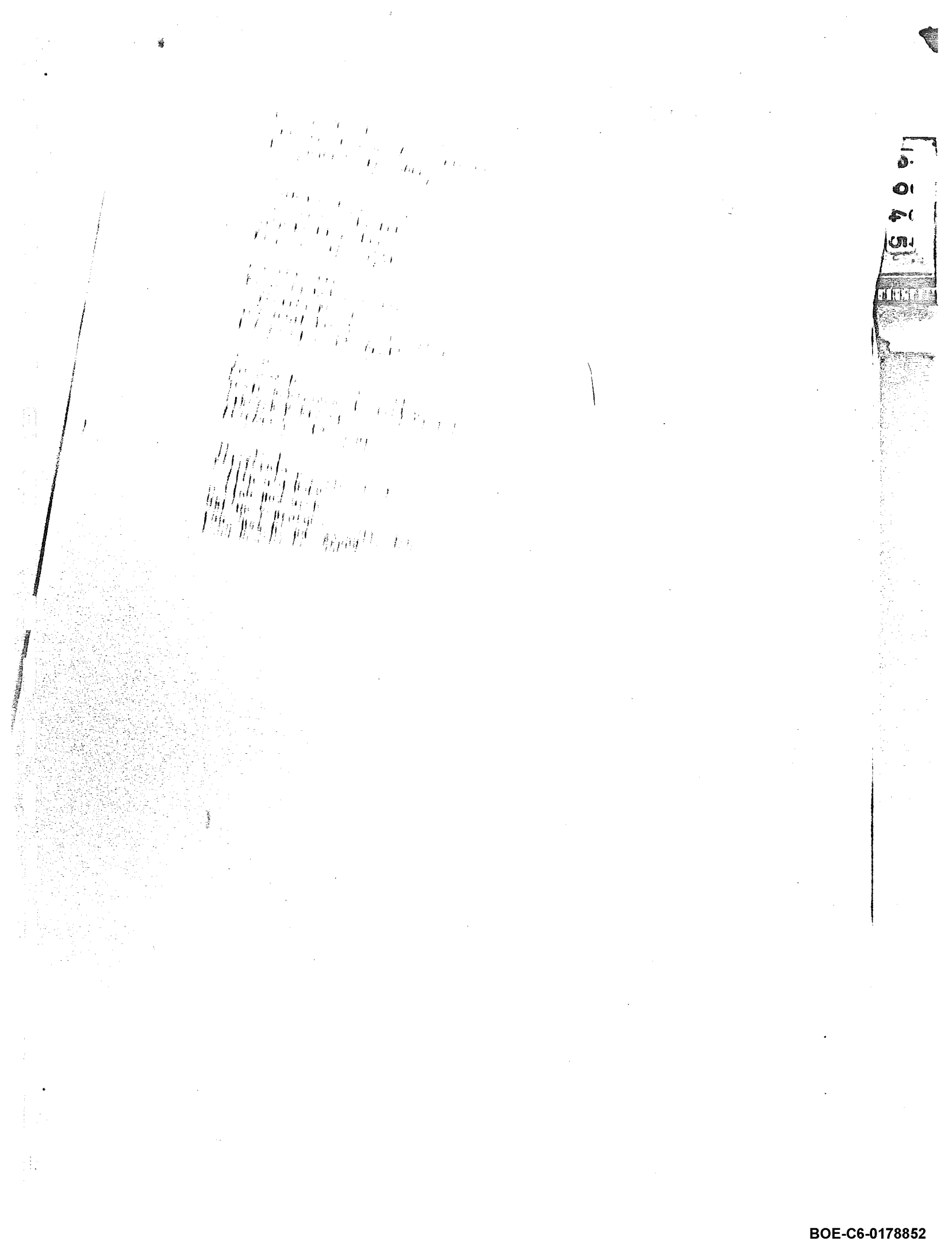
3. The preliminary report of the hydrogeologic investigation (p 2-19) should include a water table and potentiometric map. A tabulation which provides information on aquifer properties such as hydraulic conductivity and transmissivity would also be helpful.

We thank you for giving us the opportunity to review this document.

Sincerely,

Néstor O. Acedera, Manager
Assessment & Mitigation Unit
Southern California Section
Toxic Substances Control Division

cc: See attached list



cc: Anastacio Medina
Los Angeles County Health
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Jan Meyer
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California Department of
Fish and Game
Marine Research
245 West Broadway, Suite 350
Long Beach, CA 90802

STATE OF CALIFORNIA—HEALTH AND WELFARE AGENCY

GEORGE DEUKMEJIAN, Governor

DEPARTMENT OF HEALTH SERVICES
714/744 P STREET
SACRAMENTO, CA 95814
(916) 324-1826

AUG 05 1983

Ralph Tufenkian, Vice President
Western Waste Industries
19803 South Main Street
Carson, CA 90745

Dear Mr. Tufenkian:

CADILLAC - FAIRVIEW/WESTERN WASTE INDUSTRIES (DEL AMO BLVD)
HAZARDOUS WASTE SITE, TORRANCE

The purpose of this letter is to transmit the Department's stated position for site mitigation and to summarize the results of the July 26, 1983 meeting regarding the subject site. A detail of the meeting highlights (Enclosure 1) and copies of the meeting handouts are enclosed (Enclosures 3 through 8).

After you have reviewed the information please contact me at (916) 324-1826 or Thomas E. Bailey at (916) 324-3773 to arrange to proceed jointly towards resolution of this issue.

Thank you very much for your consideration and cooperation.

Sincerely,

ORIGINAL SIGNED BY
RICHARD P. WILCOXON

Richard P. Wilcoxon, Chief
Toxic Substances Control Division

Enclosures

cc: Angelo Bellomo, Acting Chief
Permits Surveillance and
Enforcement Section

John Hinton, Regional Administrator
Permits Surveillance and
Enforcement Section

Alex Kelter, M.D.
Epidemiological Studies Section

Bill Marlin
Office of Legal Services

Enclosure 1

Del Amo Hazardous Waste Site
Meeting Highlights of Discussion with Western Waste Industries*

July 26, 1983

Purpose

To discuss the status of site cleanup actions at the Del Amo site and to elaborate on the Department's conclusions and recommendations transmitted in the Department's 7/19/83 letter and to provide specific direction to Western Waste Industries in order that they might proceed with cleanup.

Introductory Statements

1. The Department intends to address Western Waste Industries Lots 12 and 13 adjacent to Normandie Avenue and Del Amo Boulevard separately from Lot 37, the site of Pond 1A (see site map attached). (Enclosure 2)

2. There are certain requirements that must be met if Western Waste Industries are to proceed with either of the cleanup options presented by the Department.

3. The handout materials distributed at the meeting give both general and specific guidance on requirements to be met. Each is summarized below:

Site Characterization

1. The Western Waste Industries Lots 12, 13, and 37 have not been adequately characterized. Additional sampling programs are required to determine the extent of contamination.

2. The following surface and subsurface investigations are recommended for Lots 12, 13 and 37. The Department's technical staff will assist in the specific development and approval of the field sampling.

Lots 12 and 13 adjacent to Normandie Avenue

1. Six surface soil samples in areas of obvious contamination or stressed vegetation to be continued at depth by borings.

2. Six subsurface borings to 20-foot depths, using split spoon sampler:
   - samples of a 200-foot center-to-center matrix;
   - analyze at five-foot intervals;
   - analyze for extractable and volatile organics and pH; and
   - prescreen samples with HNU.

3. Required cleanup actions, if any, will be developed following site characterization.

Lot 37 adjacent to Vermont Avenue

1. Six surface soil samples in areas of obvious contamination or stressed vegetation to be continued at depth by borings;
   - three subsurface borings [illegible]
   - analyze at five-foot [illegible]

*[illegible]

- analyze for extractable and volatile organics and pH; and
- prescreen samples with HNU.

2. One subsurface boring in the most contaminated area of Pond 1A. Bore to the level of background contamination or to groundwater whichever is less in depth:
   - analyze at five-foot intervals;
   - analyze for extractable and volatile organics and pH; and
   - prescreen samples with HNU.

Quality Assurance/Quality Control

A quality assurance/quality control (QA/QC) plan for soils and air data will be required for all sampling and analyses. The Department shares the concern of Western Waste Industries for a more efficient and coordinated data collection program. It was agreed that Dr. Robert Stephens, Chief of the Department's Hazardous Materials Laboratory, and his staff would assist and coordinate with Western Waste Industries' consultant and contract laboratory to come to acceptable field sampling and laboratory analysis protocols. It was further suggested that the Western Waste Industries' contract laboratory address the items outlined in "Quality Assurance Guidelines for Submission of Hazardous Waste Sample Data" (attached) to be followed up by a meeting between our respective laboratories to expedite and reach consensus regarding protocol acceptable to the Department. (Exs. 4)

Lot 37 Site Mitigation

Basically the Department has suggested two options available to Western Waste Industries by which the company can proceed with the voluntary cleanup activities. The two options center around the use of cleanup levels and associated deed restrictions of future land use. If Western Waste Industries is willing to institute appropriate deed restrictions on future land use, the Department will allow higher levels of contaminants on-site than are permissible with unrestricted uses. Final plans should also be approved by the Regional Water Quality Control Board.

1. Restricted Land Use

The cleanup level recommendation associated with restricted land use is attached (Cleanup Criteria for Western Waste Site Assuming Deed Restriction to Control Future Land Use). Essentially, it may be permissible to leave material at the existing levels of contamination on-site provided that certain mitigation goals and design are met. These constraints are discussed below. Additionally, deed restrictions will be applicable wherever contaminated soils remain on-site which have total PAH cumulative total concentrations above background concentrations (see July 26 memo "Deed Restrictions, WWI", [illegible]).

The mitigation design requirements under this option are as follows:

a. Installation of a one-foot minimum clay cap compacted to achieve a permeability of 10^{-6} cm/sec or less or equivalent to minimize percolation of water through the contaminated soil;

b. The cap and surface shall be graded to prevent [illegible] of surface water into the [illegible]

any infiltrated water runoff in the downgradient direction of the underlying aquifer and away from adjacent contaminated areas such as bog 1B;

c. Use of a three-foot minimum of clean and compacted fill between contaminated soil and the surface; and

d. All designs must meet the following emission performance criteria:
   - less than or equal to 10 ppm benzene on-site; and
   - not detected concentrations for benzene at the site's perimeter as measured by an HNU.

2. Unrestricted Land Use Cleanup Level

The cleanup level associated with unrestricted land use was calculated by using a variety of exposure routes and health-based data such as human carcinogenic risk analysis and aquatic toxicity values. These mechanisms resulted in a recommendation by staff of the Epidemiological Studies and Alternative Technology Sections of soil cleanup concentrations in the very low parts per million range (generally less than 5 ppm for total cumulative Polynuclear Aromatic Hydrocarbons [PAHs]). In effect, PAHs would have to be removed from this site to less than 5 ppm or background for the site to satisfy unrestricted use.

3. Excavation Plan Revisions

If excavation proceeds, specific additions to the "Safety Plan and Air Monitoring Program for the Excavation of Cadillac Fairview; Pond 1A., December 10, 1982, Hekimian and Assoc., Inc." are required. These are outlined in the attached July 26 memo "Specific Requirements for Western Waste Industries' Excavation Activities at WWI/CF Site". The Department's staff will assist in preparation of a revised excavation plan.

Public Participation

The Department requires that a community information program be implemented to insure that adequate information is disseminated and public comments are received. The program will include the holding of public meetings to discuss any projected cleanup plans and any subsequent changes during cleanup activities. Our Office of Public Information and Participation will assume the lead role in the public participation process.

Transportation and Safety Plan

A plan is required which addresses the hauling and disposal of any excavated materials leaving the site. Guidelines for meeting the state goals are attached ("The Preparation of a Transportation and Safety Plan") and should be adhered to closely. (Enclosure 7 A-H)

Responsible Party Action

The Department has received the information Western Waste Industries has supplied regarding other responsible parties which include past generators, haulers, [illegible]. There appears to be a number of firms who are potentially responsible parties. The Department in cooperation with the U. S. Environmental Protection Agency will proceed with responsible party actions. The Department will notify [illegible] responsibility as soon as possible. [illegible] under 3007 RCRA and 104(e) CERCLA [illegible].

Enclosure 2

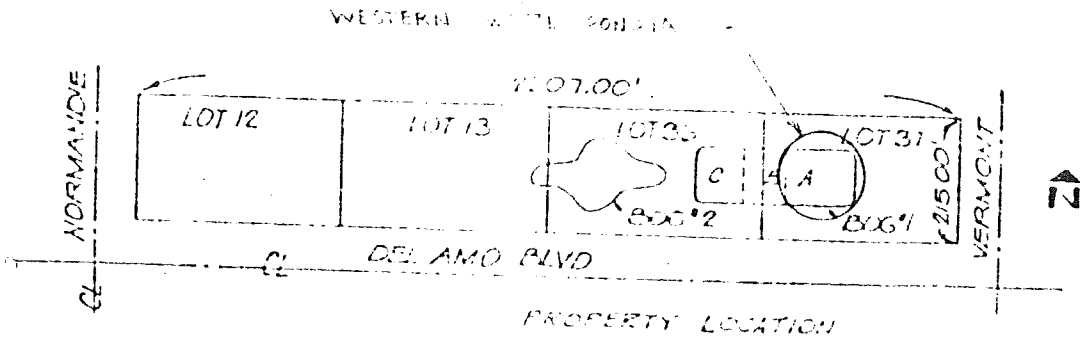
Del Amo Hazardous Waste Site
Meeting of July 26, 1983

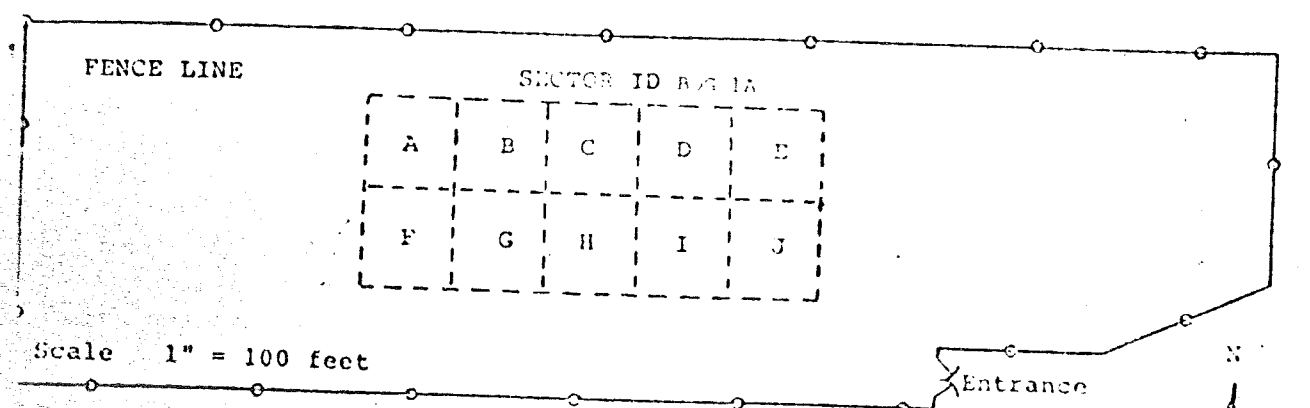
Attendance

Name	Organization
Ralph Tufenkian	Western Waste Industries
John E. Amoore	Hekimian and Associates
Ken Hekimian	Hekimian and Associates
Richard Wilcoxon	Department of Health Services
Angelo Bellomo	Department of Health Services
Tom Bailey	Department of Health Services
Alex Kelter, M.D.	Department of Health Services
Robert Stephens	Department of Health Services
Bill Marlin	Department of Health Services
Mark Galloway	Department of Health Services
Florence Pearson	Department of Health Services

SITE MAP

Enclosure 3





WESTERN WASTE

Enclosure 4

Quality Assurance Guidelines for Submission of Hazardous Waste Sample Data

Quality Assurance (QA) Manual

Each laboratory shall have developed a QA manual which is utilized on a routine basis by the laboratory staff. Although a copy of the QA manual need not be submitted with each set of analytical reports, the laboratory should be prepared to submit a copy upon request by the Department. As a minimum, the QA manual should describe the following:

- How the laboratory reports are generated, maintained, checked, and filed.
- How samples are collected, stored, and logged in and the documentation for sample chain-of-custody.
- Bench level quality control procedures and frequencies of application, including the acceptable limits for replicates and percent recoveries and corrective actions. Bench level quality control procedures should include:
  - Method blanks
  - Field replicates
  - Laboratory replicates
  - Spike samples with test or surrogate compound(s)
  - Confirmatory methods
- Maintenance and calibration of instruments.
- Types and analytical frequency of reference samples from EPA, National Bureau of Standards, etc.

Minimum Requirements for Submission of Data

- Cite the reference(s) for the extraction and analytical methods used by the laboratory.
- If the method is a modification of a standard method, a description of the modification should be submitted for review.
- If nonpublished methods are used, provide detailed descriptions of the methods.
- Several examples of chromatograms, standard curves, and printouts of GC/MS data should be submitted along with the analytical reports.
- Results of replicate and spike analyses should be submitted along with the analytical reports. As a general guideline, 10-15% of samples analyzed should be in replicate and 10-15% of samples should be spiked and percent recoveries calculated.
- Results of pertinent reference samples that the laboratory has analyzed during the past 6 months should be submitted along with the analytical reports. Pertinent reference samples are those with a similar matrix and/or analyte to the project samples.

Enclosure 5

Cleanup Criteria for Western Waste Site Assuming
Deed Restriction to Control Future Land Use

1. All waste (visually determined) will be removed.

2. A clay cap or equivalent barrier will be installed to control water intrusion.

3. Excavation of contaminated soil will be adequate to ensure that no subsequent activities -- grading, trenching for utility lines, etc., -- will penetrate to within 2-3 feet of the remaining contaminated soil.

4. Design of structures, parking lots, or other development will be adequate to protect the physical integrity of the clay cap.

5. Groundwater monitoring of the area will be done -- both upgradient and downgradient.

6. There will be no limit on the residual PAH concentration in the remaining contaminated soil provided that no readily excavatable localized contaminated zones are identified in the site characterization. Rephrased, this means that if it can be shown that the remaining contamination is confined to the next couple feet or so of unexcavated material in a limited area such as sectors A and B, then that relatively minor excavation should proceed in order to more fully protect public health in the long term and to do so in the most economical manner.

Enclosure 6

State of California

Department of Health Services

Memorandum

To : Thomas M. Bailey, Acting Chief
Site Cleanup and Emergency
Response Section

Date : July 26, 1983

Subject: Deed Restrictions,
WWI

From : Lloyd A. Batham
Hazerdous Waste Property
Evaluation Unit
Site Cleanup and Emergency
Response Section 4-1793

This memo only addresses Parcel 37 of the subject property as too little is known of the contents of Parcels 12 and that portion of 13 owned by Western Waste Industries.

If the contaminated soil is completely removed to the satisfaction of DHS no deed restrictions would be warranted.

If the currently-known contamination is allowed to remain in its current state, the following "easements, covenants, restrictions, and servitudes" should be imposed:

1) A prohibition on residential-type land uses specified in Section 25232, H&SC;

2) Only the currently proposed land use is acceptable (other new uses to require a DHS variance);

3) A prohibition on damage to the encapsulating media (a 3-foot clay cap is proposed with the possibility of a slurry cutoff wall around the sump) - no excavation, piles or wells without DHS permission.

4) DHS has right of entry and right to take samples;

5) DHS to be notified within 30 days of sale, lease or conveyance of property;

6) No subdivision without DHS permission;

7) Monitoring of water and vapor wells to be accomplished to DHS satisfaction;

8) Restrictions enforceable pursuant to Article 8, Chapter 6.5, Division 20, H&SC;

9) The deed restrictions to run with the land in perpetuity unless removed by DHS.

More characterization of the parcel could allow removal of some of the above conditions and should be performed.

State of California

Enclosure 7
Department of Health Services

Memorandum

To : [illegible] Fairview [illegible]

Date : July 26, 19[illegible]

Subject: Specific Requirements for Western Waste Industries' Excavation Activities at WWI/CF Site

From : Pamela Murcell Barc[illegible], Assoc. I.H.
ESS - S[illegible] [illegible]

The meeting on July [illegible], [illegible] between Western Waste Industries' representatives and staff members of [illegible] resulted in the need for ESS to provide specific requirements [illegible] certain aspects of the work at the WWI/CF hazardous waste site. The following information contains the[illegible] requirements.

These items should be considered minimum requirements for assuring on-site and off-site safety and air quality [illegible] the excavation [illegible].

PERSONNEL REQUIREMENTS

1) On-site project manager with the authority to close down operations if the need arises.
2) Two technicians to attend the monitoring instruments continuously during working hours.
3) One person, knowledgeable of health and safety, to be in charge of personal protective equipment, including cleaning and fit testing of respirators.
4) An odor expert to conduct odor survey off-site at the perimeter of the site and in the neighborhood. This person should be available continuously during working hours to conduct the survey at least during the first 2 - 3 days of activity. If odors are shown to be adequately controlled on-site, then his/her services may be discontinued by authority of DHS.

COMMUNICATIONS

There would need to be [illegible] communication [illegible] between the two people attending the instruments, the on-site project manager, and the off-site odor expert. [illegible] air monitoring results, and [illegible] actions at the [illegible] site.

METEOROLOGICAL MONITORING

WWI had installed a mechanical [illegible] station [illegible] the site. [illegible] would need to be maintained [illegible] wind [illegible] direction.

DECONTAMINATION FACILITIES

[illegible]

[illegible] leaving the site, including a holding pit to catch wash water. Contaminated water would then be removed by vacuum truck to the appropriate disposal site.

AIR MONITORING

1) Total aromatic hydrocarbons using benzene as an indicator.

One HNU Photoionizer (10.2 or 9.5 ev lamp) with strip chart recorder located downwind of the excavation and at the perimeter. This unit would be mobile to stay downwind.

One HNU Photoionizer, no strip chart, located at or as near as possible to the workers. This unit would also be mobile.

Both instruments would be calibrated on benzene, and each instrument would be attended continuously during working hours.

The limit of detection of the HNU is 0.1 ppm.

Background levels of total aromatic hydrocarbons would be determined prior to work being done at the site. During work at the site, any increase in the readings at the perimeter which represent [illegible] 2.0 ppm benzene for 20 minutes would require the excavation to stop. The emission would be measured for another 10 minutes. If it has not subsided to less than 0.5 ppm benzene, then the excavation would have to be covered. If the readings at the perimeter show an equivalent benzene level of 2.0 ppm, then the excavation would stop immediately and the work face would be covered.

2) Odor as naphthalene.

The odor threshold for naphthalene is approximately 0.3 ppm. An odor survey would be conducted in the neighborhood and at the site perimeter by an odor expert. The following SCAQMD levels would be used.

Category 3: Distinct, easily noticeable.
If this level is reached and there are 5 or more complaints within 15 minutes, then the excavation would stop and measures taken to control odor.

Category 4: Strong, decided.
If this level is reached, regardless of complaints, then the excavation would stop and measures taken to control odor.

The need for stopping the excavation would be based on the detected benzene level or the odor level.

3) Total dust based on PAH content in the soil.

Many of the compounds being found in the soil at the site are polynuclear aromatics of low volatility. As a result, there is no hazard due to exposure to dust and soil contaminated with these compounds. The toxicity information on many PAHs is [illegible] to test animals.

Dust control measures [illegible] the backhoe bucket and the truck [illegible] control would be [illegible]

Background samples would be taken first to establish normal dust levels in this area. During work at the site, samples would be conducted at the perimeter, upwind and downwind, for dust being contributed due to site activities.

The sampling method would be high-volume air pump with filter to be analyzed gravimetrically in a lab. At least one sample would be taken daily, with an overnight turn-around time to indicate the effectiveness of the dust control measures that day. The result should be no detectable difference between upwind sample and downwind sample.

WORKER PROTECTION

All workers would need to be equipped with the following gear.

Boots (wash and reuse)
Gloves (wash and reuse, or disposable)
Hardhats (wash and reuse)
Coveralls (disposable)
Respirators (wash and reuse face piece) equipped with cartridges for organic vapors/dust. Respirators would be of the half-mask, air-purifying type. These respirators would be appropriate provided the approval on the cartridges is not exceeded.

All workers must be physically capable of working while wearing a respirator, and must be fit tested.

In the event that the excavation would stop due to air emissions, all workers would be required to leave the work face, except for the few required to apply cover and/or other control measures.

The permissible exposure limits (PELs) for benzene and naphthalene are each 10 ppm for an 8-hour work shift. These limits would be adhered to, as well as all other applicable PELs. The ceiling limit for benzene is 50 ppm. This is a level that is never to be exceeded. Cal/OSHA regulations require that airborne levels be maintained at or below the limits regardless of the use of respirators.

Facilities would have to be on site for cleaning and decontaminating the protective equipment. The equipment would be stored on site to limit the amount of material the workers could bring home to their families.

The items, as discussed above, are necessary if AWI is to continue excavation at this site. If the company opts for a different method of site cleanup and closure, then the site and community safety plans would be reevaluated.

Enclosure 8
Revisions

THE PREPARATION OF A TRANSPORTATION AND SAFETY PLAN

Introduction

Assembly Bill 1356, approved by the Governor

"Before Hazardous waste is transported from an abandoned site to another disposal site...

...The hazardous waste hauler shall prepare a transportation and safety plan outlining safety features and procedures to be used by the hauler to protect the public during the transportation process.

...The Department (Health Services) shall review and approve the transportation and safety plan.

... The Department shall issue a certificate to the hazardous waste hauler certifying that the transportation and safety plan has been approved by the Department..."

Implementation

In preparing the Transportation and Safety Plan, the hazardous waste hauler shall include, at a minimum, discussion of the following items:

1) Haulers compliance with OSHA, EPA, and DOT Regulations (Code of Federal Regulations; Titles 29, 40, and 49, respectively).
2) Haulers compliance with the California Health and Safety Code, the California Vehicle Code, and the California Administrative Code, Titles 8 (General Industry Safety Orders), 13 (California Highway Patrol, 19 (State Fire Marshall) and 22 Department of Health Services).

3) The routes of travel from the abandoned site to the disposal sites. This should include rest, fuel, and meal stops. Excluding freeways, efforts should be made to avoid travel through heavily populated areas while transporting hazardous wastes. In addition, all transport activities should occur during daylight hours.

4) A contingency plan that will describe the activities of the hauler in the event of an emergency or hazardous waste spill during transportation. This plan should discuss protocol for emergency reporting (including notification of the Project Engineer at the Department of Health Services) and contracting for cleanup and decontamination).

5) Provisions for the transfer of materials in the event of a non-emergency breakdown.

6) Routine decontamination procedures of transporter equipment.

7) Provisions to be taken to minimize/control the release of odors or volatile air emissions (if applicable) during loading, transport, and disposal. This shall include arrangements made by the hauler to assure odor controls are continued at the disposal site.

No plan shall be approved unless such plan includes a provision for immediate cessation of activities if notified by the Department of Health Services that satisfactory compliance with all provisions of the plan is not occurring and/or a hazard, public nuisance or an environmentally threatening condition exists.

The aforementioned provisions are intended as general guidelines. Site specific conditions should also be considered when preparing the Transportation and Safety Plan.

STATE OF CALIFORNIA—HEALTH AND WELFARE AGENCY

EDMUND G. BROWN JR., Governor

DEPARTMENT OF HEALTH SERVICES
107 SOUTH BROADWAY, ROOM 8-48 7128
LOS ANGELES, CA 90012

(213) 620-2380

October 1, 1982

W.R.H. Industries, Inc.
P. O. Box 214
Gardena, CA 90247

Attn: Ralph S. Tufenkian
Vice President

Re: Assessment and Mitigation of Hazardous Wastes in/on Lot No. 37
Del Amo and Vermont, Los Angeles

Dear Mr. Tufenkian:

This office has reviewed your letter dated September 20, 1982, and the accompanying Final Report by Hekimian & Associates dated September 14, 1982. Those documents state that the wastes in Pond 1-A are non-hazardous.

Our May 5, 1982 letter to Hekimian & Associates contained instructions for analyses of samples from the site. Those instructions relative to the organic fraction determinations were not followed when samples taken June 21, 1982 were analyzed by James M. Montgomery Consulting Engineers, Inc.

In response to continuing discussions since September 14, 1982, between Kenneth Hekimian and members of this office staff relative to assessment of the subject wastes as hazardous or non-hazardous, it was agreed that the Department will have analyzed four additional samples taken from within Pond 1-A as follows:

Boring No. 3	3 foot depth; 6 foot depth
Boring No. 12	3 foot depth; 6 foot depth

These samples will be extracted for acid and base/neutral extractable organics, and quantified by gas chromatograph at our Berkeley laboratory. Should the analyses for organic contaminants not show significant concentrations of hazardous constituents, they will also be analyzed for the toxic heavy metals.

Should your consultants recommend running parallel analyses of the above samples, they must consult with Tom Li of our Berkeley laboratory regarding sample workup and analytical methods to be used, so that comparable results will be obtained.

Should the wastes be determined to be hazardous, or should you decide to manage the wastes as hazardous in lieu of completion of the analyses, then at least one week prior to any proposed field work, you must submit to this office a written report of the following:

1. Drawings and/or narrative fully describing the proposed activities.
2. Time schedule for implementation.
3. Names, addresses, phone numbers, and certification of all participants.
4. Contingency plans, including health and safety measures for participants and nearby residents if necessary after consultation with Cal-OSHA.

If you have any questions, please call Roy Thielking of my staff at the letterhead telephone number.

Sincerely yours,

for Miller E. Chambers, P.E.
Permits, Surveillance and
Enforcement Section
Hazardous Waste Management Branch

MEC:mw

cc: Hekimian & Associates

California Regional Water Quality Control Board, Los Angeles
Attn: Raymond M. Hertel

South Coast Air Quality Management District
Attn: Jeb Stuart

C & W Basin Water Replenishment District
Attn: Chuck Milam

Montrose

STATE OF CALIFORNIA—~~RESOURCES AGENCY~~

GEORGE DEUKMEJIAN, XXXXXXEDMUND G. BROWN JR. Governor

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD—
LOS ANGELES REGION

107 SOUTH BROADWAY, SUITE 4027
LOS ANGELES, CALIFORNIA 90012 — 1596
(213) 620-4460

MAY 31 1983
of Hearing
LOS ANGELES

May 27, 1983

CERTIFIED NO. 838419

Montrose Chemical Corporation of California
P.O. Box E
Union, New Jersey 07083

ATTENTION: Mr. Samuel Rotrosen, President

Gentlemen:

This is in reference to Clean Up and Abatement Order No. 83-1 issued by this Board on May 6, 1983, requiring you to (1) immediately cease the discharge of DDT-contaminated stormwater from your property, (2) conduct a sampling program to determine the extent of DDT contamination in soils at your facility and adjacent property, and (3) implement a remedial program to eliminate the contamination which has resulted from the release of DDT from your facility.

In accordance with discussions between our staff, representatives of the Environmental Protection Agency, and Montrose representatives at a meeting held in EPA's Regional Office in San Francisco on May 24, 1983, we have amended paragraph 2. of Order 83-1 to extend the due date for submission of the Sampling Plan for the conduct of the sampling program to June 24, 1983.

All other conditions of the order are unchanged. Enclosed is a copy of Amended Order No. 83-1.

Very truly yours,

Raymond M. Hertel

RAYMOND M. HERTEL
Executive Officer

cc: See attached mailing list

Attached mailing list

cc: Montrose Chemical Corporation of California,
ATTN: Robert K. Yukihiro
Environmental Protection Agency, Regional Administrator,
ATTN: Toxics and Waste Management Division
Environmental Protection Agency, ATTN: Kathleen Shimmin
Department of Fish and Game, Region 5, ATTN: Mr. Fred Worthley
Department of Fish and Game, Marine Resources Region, ATTN: Mr. John Baxter
City of Torrance, ATTN: City Attorney
City of Los Angeles, Bureau of Sanitation
Coastal Commission, South Coast District
Los Angeles Regional Board Members
State Water Resources Control Board, Executive Office
ATTN: Mr. Clint Whitney, Executive Director
State Water Resources Control Board, Office of the Chief Counsel
ATTN: Mr. William R. Attwater
ATTN: Mr. Craig Wilson,
ATTN: Mrs. Kathy Keber
Attorney General
Air Resources Board
Governor's Office
Los Angeles County Engineer, Sanitation Division
Department of Water Resources, Attn: Mr. R. Y. D. Chun
Department of Health Services, ATTN: Mr. John Hinton, Los Angeles
Department of Health Services, Berkely
Los Angeles County Health Services
Los Angeles County Flood Control District, ATTN: John Mitchell
Port of Los Angeles, ATTN: W. Calvin Hurst
South Coast Air Quality Management District, ATTN: Mel Schreckengot
Anthony O. Garvin
David L. Mulliken

STATE OF CALIFORNIA
GEORGE DEUKMEJIAN, Governor

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD--
LOS ANGELES REGION

107 SOUTH BROADWAY, SUITE 4027
LOS ANGELES, CALIFORNIA 90012-4596
(213) 620-4460

May 27, 1983

CLEAN UP AND ABATEMENT ORDER NO. 83-1

The California Regional Water Quality Control Board, Los Angeles Region, finds:

1. Montrose Chemical Corporation of California (Montrose) owned and/or operated a facility at 20201 South Normandie Avenue in Torrance, California, for the manufacture and distribution of dichloro diphenyl trichlorethane (DDT). Production of DDT has ceased, and Montrose is now dismantling this facility.

2. The California Department of Health Services approved the RCRA Closure Plans and Procedures submitted by Montrose in August 1982. The Closure Plan addressed only the dismantling and disposal of storage tanks and their contents. However, the discharge of DDT - contaminated rainfall runoff from the facility was not addressed and remains unabated.

3. The discharge of DDT - contaminated rainfall runoff from the facility and adjacent property, its effects on Dominguez Channel waters and subsequently Consolidated Slip waters and sediments, is a condition of pollution which will not be abated until appropriate remedial measures are taken.

4. Montrose is the only facility which has manufactured DDT in the area tributary to the Torrance Lateral of Dominguez Channel and to Consolidated Slip.

5. Storm runoff from the plant property drains through a narrow, unlined channel, ponds, and then overflows into a catch basin approximately 500 feet from the plant. Water in the catch basin flows to Los Angeles County Flood Control District's (LACFCD's) Torrance Lateral which drains into the Dominguez Channel, and ultimately into Consolidated Slip of Los Angeles Harbor.

6. The Water Quality Control Plan for Los Angeles River Basin specifies that:

"No individual pesticide or combination of pestidices shall be present in concentrations that adversely affect beneficial uses. There shall be no increase in pesticide concentrations found in bottom sediments or aquatic life.

All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the Regional Board,"

The Environmental Protection Agency has established ambient water quality criteria to protect human health and aquatic life, as follows:

"For DDT and its metabolites the criterion to protect saltwater aquatic life as derived using EPA Guidelines is 0.0010 µg/l (ppb) as a 24 hour average and the concentration should not exceed 0.13 µg/l at any time.

For the maximum protection of human health from the potential carcinogenic effects due to exposure of DDT through ingestion of contaminated water and contaminated aquatic organisms, the ambient water concentration should be zero, based on the non-threshold assumption for this chemical.

For consumption of aquatic organisms, excluding consumption of water, the levels required for human protection are 0.00024 µg/l (ppb) 0.00003 µg/l, and 0.0000024 µg/l, respectively.

7. Soil and water samples from the drainage path on Montrose and adjacent property collected on November 23, 1981, by California Department of Fish and Game staff showed total DDT concentrations as high as 1,410 parts per billion (ppb) in water and 8,274 parts per billion (ppb) in soil.

8. On November 9 and 10, 1982, Environmental Protection Agency staff collected water samples downstream of the facility as well as adjacent off-site soil samples. Water samples showed concentrations of 209 to 306 ppb total DDT leaving the site and 625 ppb in water ponded off-site. Total DDT concentrations in adjacent offsite soils were as high as 1,900 parts per million (ppm).

9. Los Angeles County Flood Control District has collected water samples from Torrance Lateral at Main Street, a tributary to Dominguez Channel, since 1977. Both storm and dry weather samples are taken. During the period 1977-1982, the average dry weather concentration of total DDT was 0.75 ppb as compared with average storm water concentrations of 5.88 ppb. Maximum storm water total DDT concentrations have been as high as 2 ppm.

10. The California State Mussel Watch is a marine monitoring program conducted by the California Department of Fish and Game for the State Water Resources Control Board. The Mussel Watch program in Los Angeles-Long Beach Harbors in 1980 revealed elevated levels of DDT in mussels at various stations in the harbors. In 1981, analysis of mussels taken in Consolidated Slip (L.A. Harbor) at the terminus of the Dominguez Channel showed a concentration of 2,395 ppb total DDT.

11. During the course of manufacture, handling and distribution of DDT, residues of this material were intentionally or negligently deposited on and in the soils at various locations at the Montrose facility and adjacent properties where stormwater could come in contact with these residues and carry them off the property.

12. The existing presence of DDT residues in soil causes or threatens to cause a condition of pollution because they could drain or otherwise be carried to waters of the State. This material could be harmful to persons or animals.

13. The discharge of pollutants to waters of the State except as authorized pursuant to waste discharge requirements, is prohibited by Section 13376 of the California Water Code. Montrose Chemical Corporation does not have valid waste discharge requirements which would authorize a discharge of pollutants.

14. This enforcement action is being taken for the protection of the environment and as such is exempt from the provisions of the California Environmental Quality Act (Public Resources Code, Section 21000, et seq.) in accordance with Section 15121, Chapter 3, Title 14, California Administrative Code.

Clean Up and Abatement Order
Order No. 83-1

ORDER

1. The California Regional Water Quality Control Board, Los Angeles Region, in accordance with Section 13304 of the California Water Code does hereby order Montrose Chemical Corporation of California to cease the discharge of DDT-contaminated stormwater, clean up these DDT-contaminated soils on Montrose and adjacent property and to abate the effects thereof forthwith. The clean up shall include:

   (1) A sampling program approved by the Executive Officer to delineate the horizontal and vertical distribution of DDT in soils on Montrose and adjacent property.

   (2) Remedial action which may involve the removal of soil contaminated with DDT and disposal of it at a Class I disposal site. The results of all soil tests shall be submitted for approval, and the extent of soil to be removed shall be subject to approval by the Executive Officer of the Board. An equally effective alternate plan may be submitted for approval by the Executive Officer.

2. On or before June 24, 1983, Montrose Chemical Corporation is hereby directed to submit in writing a Sampling Plan to conduct a comprehensive sampling program to identify the extent to which surface soils and subsurface soils, both on and off Montrose property, have been contaminated with DDT. The plan is to be implemented only after approval by the Executive Officer of the Board.

3. Within 60 days after approval of the Sampling Plan by the Executive Officer, Montrose Chemical Corporation shall submit a written report describing the data collected and findings of the sampling program.

4. The Executive Officer will review the written report showing the data and findings of the sampling program, and will transmit to Montrose the results of that review, including specific remedial measures to be implemented by Montrose.

RAYMOND M. [illegible]
Executive Officer

[illegible]
Date

STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD—
LOS ANGELES REGION
1 SOUTH BROADWAY, SUITE 4027
LOS ANGELES, CALIFORNIA 90012-4596
(213) 620-4460

GEORGE DEUKMEJIAN, Governor

May 6, 1983

CLEAN UP AND ABATEMENT ORDER NO. 83-1

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8. On November 9 and 10, 1982, Environmental Protection Agency staff collected water samples downstream of the facility as well as adjacent off-site soil samples. Water samples showed concentrations of 209 to 306 ppb total DDT leaving the site and 695 ppb in water ponded off-site. Total DDT concentrations in adjacent offsite soils were as high as 1,900 parts per million (ppm).

9. Los Angeles County Flood Control District has collected water samples from Torrance Lateral at Main Street, a tributary to Dominguez Channel, since 1977. Both storm and dry weather samples are taken. During the period 1977-1982, the average dry weather concentration of total DDT was 0.75 ppb as compared with average wet weather concentrations of 5.88 ppb. Maximum storm water total DDT concentrations have been as high as 35 ppb.

10. The California State Mussel Watch is a marine monitoring program conducted by the California Department of Fish and Game for the State Water Resources Control Board. The Mussel Watch program in Los Angeles-Long Beach Harbors in 1980 revealed elevated levels of DDT in mussels at various stations in the harbors. In 1981, analysis of mussels taken in Consolidated Slip (L.A. Harbor) at the terminus of the Dominguez Channel showed a concentration of 2,395 ppb total DDT.

11. During the course of manufacture, handling and distribution of DDT, residues of this material were intentionally or negligently deposited on and in the soils at various locations at the Montrose facility and adjacent properties where stormwater could come in contact with these residues and carry them off the property.

12. The existing presence of DDT residues in soil causes or threatens to cause a condition of pollution because they could drain or otherwise be carried to waters of the State. This material could be harmful to persons or animals.

13. The discharge of pollutants to waters of the State except as authorized pursuant to waste discharge requirements, is prohibited by Section 13376 of the California Water Code. Montrose Chemical Corporation does not have valid waste discharge requirements which would authorize a discharge of pollutants.

14. This enforcement action is being taken for the protection of the environment and as such is exempt from the provisions of the California Environmental Quality Act (Public Resources Code, Section 21000, et seq.) in accordance with Section 15121, Chapter 3, Title 14, California Administrative Code.

ORDER

1. The California Regional Water Quality Control Board, Los Angeles Region, in accordance with Section 13304 of the California Water Code does hereby order Montrose Chemical Corporation of California to cease the discharge of DDT-contaminated stormwater, clean up these DDT-contaminated soils on Montrose and adjacent property and to abate the effects thereof forthwith. The clean up shall include:

   (1) A sampling program approved by the Executive Officer to delineate the horizontal and vertical distribution of DDT in soils on Montrose and adjacent property.

   (2) Remedial action which may involve the removal of soil contaminated with DDT and disposal of it at a Class I disposal site. The results of all soil tests shall be submitted for approval, and the extent of soil to be removed shall be subject to approval by the Executive Officer of the Board. An equally effective alternate plan may be submitted for approval by the Executive Officer.

2. Within 30 days of the effective date of this Order, Montrose Chemical Corporation is hereby directed to submit in writing a Sampling Plan to conduct a comprehensive sampling program to identify the extent to which surface soils and subsurface soils, both on and off Montrose property, have been contaminated with DDT. The plan is to be implemented only after approval by the Executive Officer of the Board.

3. Within 60 days after approval of the Sampling Plan by the Executive Officer, Montrose Chemical Corporation shall submit a written report describing the data collected and findings of the sampling program.

4. The Executive Officer will review the written report showing the data and findings of the sampling program, and will transmit to Montrose the results of that review, including specific remedial measures to be implemented by Montrose.

Raymond M. Hertel

RAYMOND M. HERTEL
Executive Officer

May 6, 1983
Date

File Copy 11/C-21

STATE OF CALIFORNIA—HEALTH AND WELFARE AGENCY

EDMUND G. BROWN JR., Governor

DEPARTMENT OF HEALTH SERVICES
107 SOUTH BROADWAY, ROOM 7128
LOS ANGELES, CA 90012
(213)620-2380

December 27, 1982

Dr. Ken Hekimian
Hekimian & Associates, Inc.
One Pacific Plaza
7777 Center Avenue, Suite 500
Huntington Beach, California 92647

Dear Dr. Hekimian:

Subject: Planned Excavation - Cadillac Fairview, Pond 1A

We have reviewed the additional information you had submitted under your cover letter of December 22, 1982, concerning the approval process for the air monitoring program to be employed during the excavation of Cadillac Fairview, Pond 1A.

In view of the fact that the material to be excavated from Pond 1A is either non-hazardous or only marginally hazardous, we hereby approve the commencement of excavation activities. We do request, however, that you keep the staff of the South Coast Air Quality Management District fully informed of all such activities.

If you have any questions regarding this letter, please contact me or Harry Sneh of my staff.

Sincerely yours,

William E. Chambers

John A. Hinton, P.E.
Regional Administrator
Southern Region
Permits, Surveillance
and Enforcement Section
Hazardous Waste Management Branch

JH:HS/cc

cc: South Coast Air Quality Management District
Attn: Ed Camrena

California Regional Water Quality Control Board, Los Angeles Region
Attn: Mr. Raymond M. Hertel, Executive Officer

Western Waste Industries
Attn: Mr. Ralph F. Tufenkian, Vice President

bcc: Tom Jones
Pete Rogers

4. Plan of mitigation for the excavation of hazardous waste at the Cadillac-Fairview Pond 1A site shall be submitted to this office and must include but not be limited to the following:

I. Health, Safety & Protection Approved by CAL/OSHA

A. It is of the utmost importance that all personnel involved in and around the excavation area be informed of real and potential hazards associated with the materials present and adhere to all pertinent regulatory safety standards.

B. On-site Worker Safety

1. An Authorized representative of the site contractor shall be on site during working hours. When not present, a daily appointed representative shall give orders and direction.

2. Any person deemed by the site contractor as incompetent, unsafe to himself or fellow workers, disorderly, or otherwise unsatisfactory shall be replaced.

3. All persons on site must be trained in the use, limitations and maintenance of, and fitted with the appropriate protective clothing and respiratory equipment.

4. All persons on site operating any necessary machinery or heavy equipment shall be trained in and competent with it's operation. In addition, any subcontractors utilized in any capacity shall conform to the required clothing and respiratory requirements as well as all other safety policies.

5. Air quality on site will be monitored by a qualified person for toxic and combustible contaminants. A qualified person will also direct the donning of required suitable respiratory devices based upon contaminant identity and concentration.

6. No smoking, eating, or drinking is permitted on site unless in an approved designated area.

7. Sufficient water shall be onsite for cleaning purposes.

8. An emergency shower and eyewash for decontamination shall be onsite during working hours.

9. The telephone number of the emergency medical care facility will be available at the work area.

C. Off-site Safety

1. An air quality monitoring program approved by the South Coast Air Quality Management District office will be provided, based on established standards, at the project boundary and records kept.

2. Should certain safety limits be approached or exceeded, the appropriate prearranged response condition shall be implemented which may include work stoppage, decontamination procedures, emergency evacuation of personnel and/or adjacent home owners by Police and fire officials, or the reporting of such events to appropriate concerned agencies.

3. Further guidance can be obtained from CAL/OSHA Consultation Service concerning Health, Safety and Protection.

II. Hazardous Material Location, Distribution & Indentification

A. A detailed area map outlining the boundaries of contamination subject to removal will be generated prior to site excavation.

B. Chemical: identification and analysis of hazardous contaminants shall be performed on all samples extracted from the area excavated to verify any existing contamination. In addition, monitoring will occur as event conditions on site change.

III. Hazardous Materials Excavation

A. A hazardous materials excavation can only proceed after a safe course of action is devised for each phase of the excavation.

1. An objective of the mitigation project is to maintain acceptable air quality at the project boundary. This shall be achieved by controlling the emissions rate at the source through strict control over rate of excavation, surface area exposure, and use of decontamination measures.

2. Preventative measures shall be taken to control any subsurface perched water, water accumulated by rainfall, or utilized during the course of excavation that may cause a spreading of the contaminated area.

B. Excavation of subsurface deposits shall proceed in a phased manner subsequent to surface removal and contingent upon results of geological and chemical analysis.

C. Offsite transport of excavated wastes are to be undertaken only by duly registered hazardous waste haulers.

D. Contaminated material shall be transported for disposal to the nearest available Class I which will accept the material.

E. All transport vehicles shall comply with DOT regulations.

F. All handling of hazardous materials shall conform to RCRA regulations.

G. Decontamination of trucks and equipment is mandatory a verification system must be developed to ensure proper decontamination.

H. During excavation, soil and air quality sampling shall be periodically performed to ensure compliance with safety and disposal requirements.

I. Excavation shall not be permitted during inclement weather, smog alerts, or under low inversion/low wind conditions. During these conditions, corrective actions must be undertaken where air quality is adversely threatened due to exposed excavation.

J. Excavation shall occur during normal daylight hours and proceed during the normal work week unless otherwise authorized.

K. At the end of each work day, an appropriate cover of clean fill will be placed over any exposed contaminants.

L. A decontaminating agent, when needed, will be applied to exposed contaminated material. The rate of application, methodology, and removal of this materials, as prescribed by technical personnel, will be consistent with the objectives of air quality control and safe hazardous material removal.

M. A daily activity report shall be maintained at all times during the duration of the project.

IV. Security

With increased public awareness and the resulting sensitivities associated with a project of the nature, it is important that the entire site be provided with a security network limiting site access to only those parties having direct interest in the project.

V. In the event of any hazardous material spillage or escape while vehicles are enroute to disposal, a rapid response capability utilizing appropriate specialty clean-up equipment and trained personnel shall be available.

VI. A final summary report of the excavation is to be submitted to this department within two weeks from receipt of all laboratory analysis.

This Department may suspend all clean-up operations at the site at any time should conditions adversely affecting Public Health & Welfare arise.

We look forward to working with you in achieving this clean-up task in a safe and expeditious manner.

Should you have any questions, please call me or Gurmel Singh at the above number.

Sincerely yours,

for John A. Hinton, P.E.
Regional Administrator
Southern Region
Permits, Surveillance
and Enforcement Section
Hazardous Waste Management Branch

JH:GS/cc

bcc: Tom Jones
Pete Rogers

Long Beach Area
Abandoned Site Prog
Site Investigation Status

Site Name: Jones Chemical

Location: 1401 W. Del Amo Blvd

City: Torrance

Contact: (Mr. Derchick -- Gen. Manager and/or President)

Staff Person: MKP/CJ

Problem-History: leaking chemicals!

ASP Action to date: Jones Chem. had a sewer line w/ L.A. City which collapsed. It then contracted with Montrose Chemical (next door) to route its industrial sewage out on Normandie (County). L.A. Co. Flood Control was doing work on the culvert by the railroad tracks (which passed the facility) and cut off the sewer on Normandie.

Jones Chemical allowed rainwater to drain into the ditch by the tracks and it pooled up. In Feb. (appro[x]) an incident occurred where an animal became sick [illegible] acid

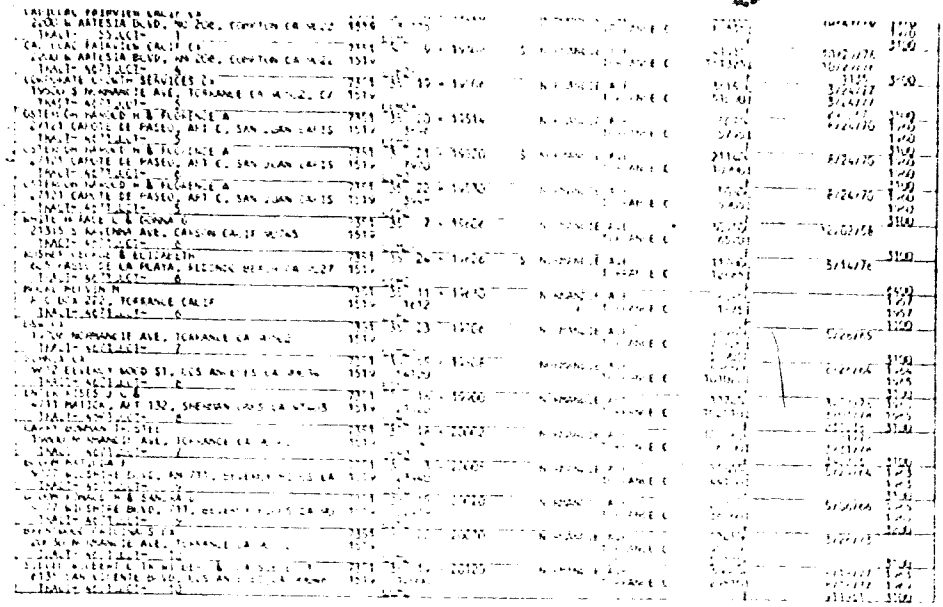
Mary Cooper (DHHS - LA Reg.) said testing was done & the problem was caused by release of dark rainwater to the ditch. Further testing was done & this is no longer the case.

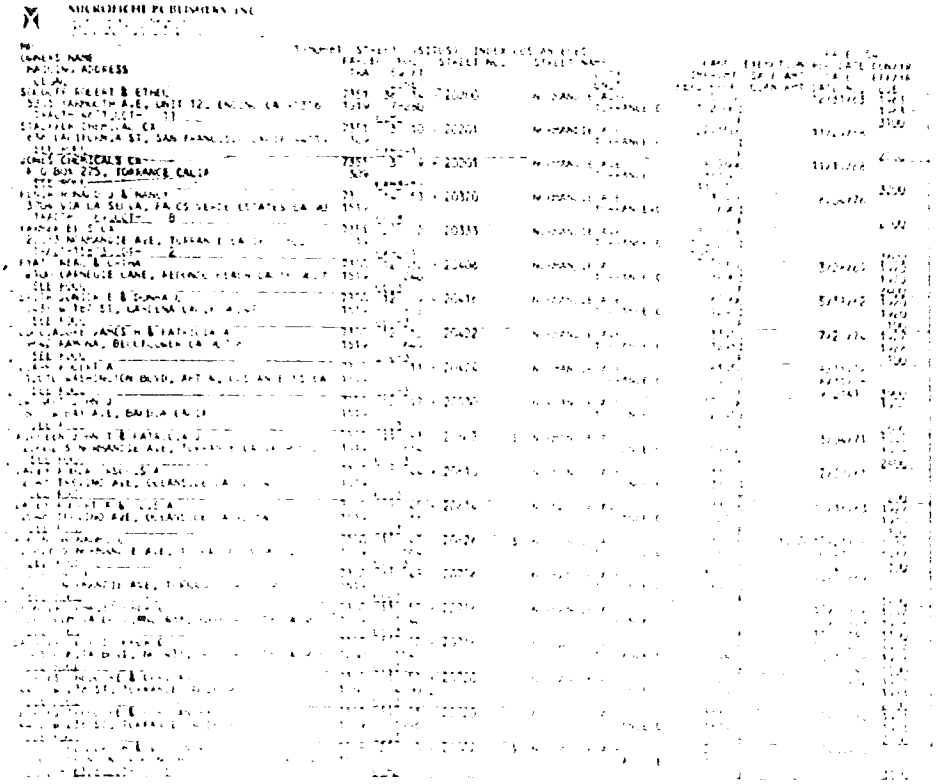
Now Jones collects washwater in a sump and pumps it up [illegible] to another sump where it is discharged [illegible] [illegible] (acid-alkaline neutralizing). From there it is pumped into a 30 ft deep dry well (also sanitary [illegible]) [illegible] -- this system is [illegible] the plant's [illegible] [illegible] [illegible] dry well is pending [illegible]

ASP proposed action

2981

MONTROSE FILE





LONG BEACH AREA
Abandoned Site Project
Investigation Status

9-17-81

E NAME Jones Chemical Co.

ATION 1300 Block of Del Amo on N. side between W. + Normandie Eastern

L.A. (not County)

NTACT

taff person

oblem- History

Action To Date County Engineers and County Sanitation have no files
Mr. Ken Terry, Chief Industrial Waste Inspector, City of L.A.
Industrial Waste Control said they are "a big chemical
supplier". He arranged for staff to access files in San
Pedro on 9-18-81

Proposed Action See L.A. files in San Pedro City Hall